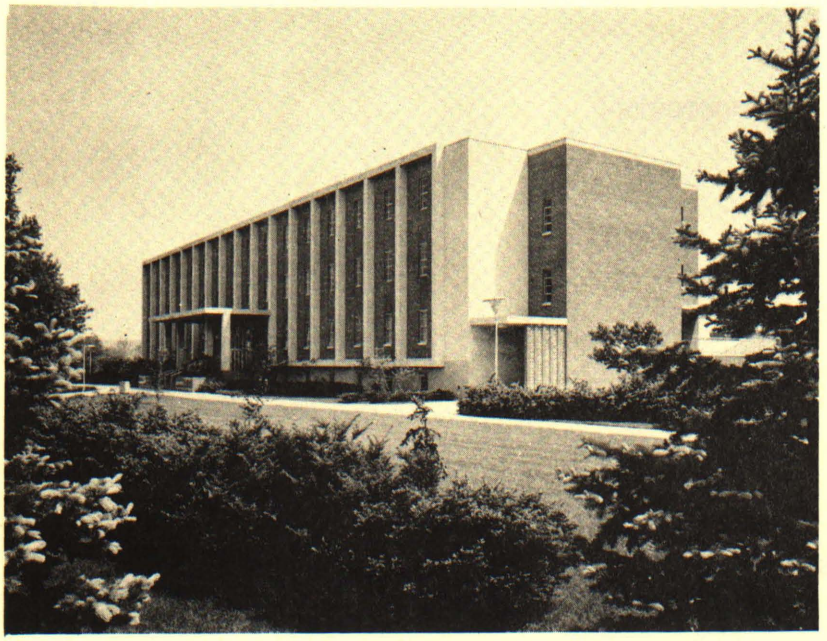
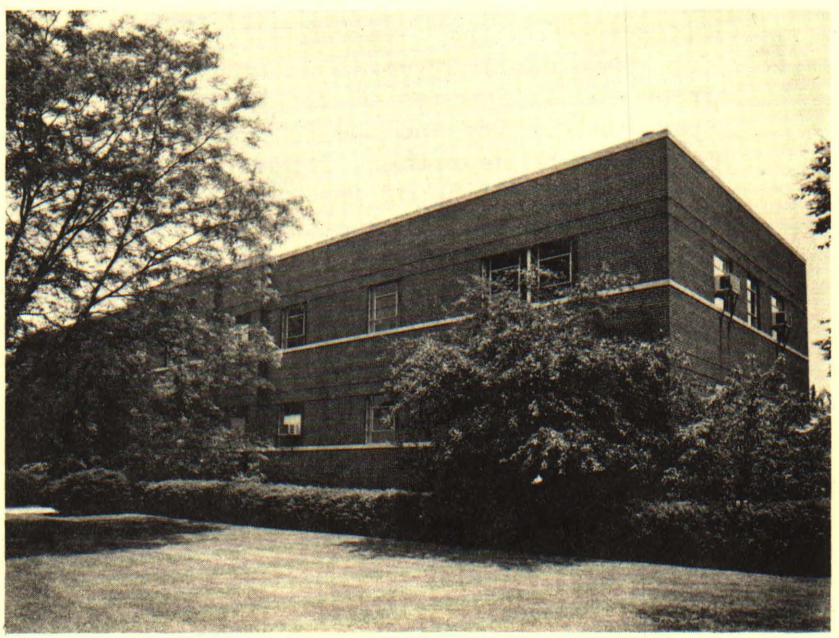
HORTICULTURAL SERIES 436
MARCH 1976



HOWLETT HALL
The Ohio State University

Department of Horticulture

The Ohio State University
and
Ohio Agricultural Research and Development Center



GOURLEY HALL
Ohio Agricultural Research and Development Center

-CONTENTS-

PREFACE

This publication is an attempt to summarize the current programs and activities of the Department of Horticulture at the Ohio State University and the Ohio Agricultural Research and Development Center. The department represents one of the larger and more complex organizations of its type in the country, with integrated research, resident instruction and cooperative extension functions. An attempt is continually made to update and increase the revelancey of the department programs to serve the horticultural informational need of the people of Ohio and to facilitate the development, to the full potential, of the varied horticultural industries of the state.

DEPARTMENT OF HORTICULTURE

The Ohio State University
and
Ohio Agricultural Research and Development Center

HORTICULTURE - THE PROFESSION

Horticulture is one of the oldest professions known to man. It is a dynamic and expanding field encompassing the production, storage and utilization of fruits and vegetables for the everyday diet as well as the production and use of flowers, ornamental plants and trees to beautify, enrich, and preserve the environment.

There is increasing national concern over environmental quality and natural beauty. There is likewise increased emphasis being directed toward the improvement of the nutritional standards of the people of the world and the increased use of quality fruit and vegetable products to supply these dietary needs. Gardening, and horticultural activities in general, are also assuming increased importance as a leisure time recreational activity.

There are expanding demands for horticultural goods and services as a result of increasing interest in plants and plant products. There are also significant problems to be solved if these demands are to be satisfied and if developing opportunities are to be realized. Horticultural crop production is currently an intensive user of hand labor, yet there is projected to be a continuing decline in the availability of willing and qualified agricultural workers. To meet the challenge of the next quarter century, it is apparent that there must be continuing emphasis placed upon improving production efficiency as well as the quality of horticultural products offered the consumer. It is also apparent that conventional sources of energy will increase in cost and diminish in availability dictating that greater emphasis be placed upon the increasing efficiency in the use of energy. Horticulture will also be called upon to play an even more active role in preserving the environment both through minimizing potential adverse effects of production practices, as well as through the use of plants to enrich the environment. Horticulture can, and does, make a positive contribution to the quality of the environment and to the beauty of our surroundings.

HORTICULTURE IN OHIO

Ohio is a leading horticultural state. Because of its georgraphic location, climate, soils, and population density, Ohio has a wide diversity of horticultural industries. It ranks first among the states in greenhouse vegetable production, third in floral crop production, second in the production of processing tomatoes, ninth in apple production, second in nursery crop production, and fifth in fruit, vegetable and food processing.

Value of Ohio Horticultural Crops-Millions

	Farm Value	Retail Value
Floral Crops	$ 33	$110
Nursery Crops	17	68
Fruits	17	57
Vegetables	65	310
	$132	$545

While the farm value of horticultural crops is significant, it represents only a small portion of the total impact of these horticultural industries upon the economy of the state. For example, the production segment of the vegetable industry provides the raw materials needed to support the vegetable processors of the state and make possible their major contributions to the local and state-wide economies. Raw materials represent only approximately 20% of the final value of processed fruits and vegetables, 30% of flowers and pot plants, 25% of nursery plants and 30% of fresh fruits and vegetables. The 600 producers of floral crops, provide much of the materials needed to support the 1,400 retail florist establishments of the state. The nurserymen provide the basis for garden centers, as well as, landscape design and maintenance firms.

It is important to note that a high proportion of the dollars generated through the final sale of various horticultural goods and services are expended for labor. These monies then circulate freely within local economies.

Horticulture is important to the state and shows every indication of becoming even more important in the future. The demand for college graduates with a broad training in horticulture is expected to increase rapidly over the next 20 years. During the period from 1970-1975 the number of students majoring in Horticulture at the Ohio State University increased from 133 to approximately 400. The opportunities are nearly unlimited, the challenge is great.

THE DEPARTMENT

The Department of Horticulture at The Ohio State University and the Ohio Agricultural Research and Development Center has long been recognized as one of the leading horticultural departments in the United States. It is one of the oldest departments on the campus, being formed in January of 1881, as a "Committee of Horticulture and Botany" in the School of Agriculture. This first "Committee" was headed briefly by Mr. A. P. Morgan, but soon became the responsibility of Professor William R. Lazenby. In 1891, Botany became a separate department and Horticulture, which was then joined with Forestry, was headed by Professor Lazenby, who continued in this position until 1908.

The Department of Horticulture has continued to grow and expand. In 1969, the Forestry division of the department was separated from Horticulture and attached to the new School of Natural Resources. There are presently 35 full time professional faculty positions assigned to the department; 22 are located in Howlett Hall on the OSU campus in Columbus, 11 are located in Gourley Hall on the OARDC Campus in Wooster and 2 are located at Area Extension Centers. There is a close coordination between the two principle locations to insure one strong cohesive unit.

The department is organized with a chairman based in Columbus. He is responsible for the direction of the coordinated research, extension and resident instruction programs of the total department. Because of the varied and diverse responsibilities of the position, it is essential that the chairman concentrate his full efforts on the administration of the department. In the fall of 1970, an Associate Chairman was appointed. He is stationed at Wooster and devotes approximately 70% of his time to administration with emphasis on the OARDC based programs.

The physical facilities of the department are some of the best in the nation. The Columbus based staff are housed in a modern Horticulture, Forestry and Food Technology Center, Howlett Hall. This facility is located on the West Campus and was first occupied in the Fall of 1969. The facility comprises 62,500 sq. ft.

of space for staff ofices, classrooms, laboratories, graduate student offices and a modern food processing pilot plant. There is also 21,300 sq. ft. of greenhouse space, and a modern headhouse with growth chamber facilities attached to Howlett Hall.

Excellent facilities also exist on the OARDC campus in Wooster. In Gourley Hall, completed in 1950, there are 19,000 sq. ft. of office and laboratory space with adjacent modern and recently rennovated greenhouse and headhouse facilities. Also, assigned to the Department are 2 farms--Horticulture Unit 1 and Horticulture Unit 2--on the OARDC campus, a farm on the OSU campus, and "Overlook", a farm approximately 25 miles south of Columbus. The 12 branches of the Ohio Agricultural Research and Development Center, strategically located throughout Ohio, also play an important role in the field research program of the department. Active fruit research programs are carried out at 4 of these branches, and vegetable research is conducted at 3 of the branches.

The basic philosophy of the department has been, and still is, to serve the people of Ohio through working with the various horticultural interests of the state and to help the varied industries reach their full potential. Teaching programs are designed to provide the depth of training needed by students as they assume their varied roles within the horticultural industries. Research emphasis is heavily oriented toward seeking solutions to current problems and to the development of new concepts to insure future industry growth. Extension programs have been closely integrated with research efforts and organized in such a way as to facilitate the rapid adoption of new technologies.

A recognized strength of the department is a strong plant product processing program as an integral part of the total departmental effort. This provides the opportunity to follow the production of a commodity from the seed to the consumer. The final evaluation of new production techniques and potentially superior cultivars must typically be evaluated in terms of the processed product. Conversely, new fruit and vegetable processing technology often provides new opportunities for adjustments in production technology. Without this strong fruit and vegetable processing program, the contributions of the department would be materially weakened.

With the increasing interest in many phases of horticulture by the consuming public, the demands for horticultural information has increased dramatically. The department recognizes the responsibility of serving the needs of this segment of our clientele. A Home Horticulture Center to provide guidance and materials to assist agents in serving this need is under development.

Times change and consequently departmental programs must change to insure that the resources available result in the greatest possible benefits. Recently improved facilities and the addition of new professional faculty positions has provided the department the opportunity to add new dimensions to the total effort.

FACULTY

It is recognized that the real strength of a department lies in its faculty and staff. There exists among all personnel a strong cooperative spirit and dedication to the roles and objectives of the department. It is the faculty and the supporting staff that have projected the department to its present position of national prominence. This could not have been accomplished, however, without the support provided by the leadership of the College of Agriculture, The Ohio Agricultural Research and Development Center and the Cooperative Extension Service.

With the young and dynamic spirit that currently exists within the faculty of the department, even greater heights of achievement are expected in the immediate future.

FACULTY AGE DISTRIBUTION
March 1, 1976

Age	No. of Faculty
60 - 64	3
55 - 59	2
50 - 54	6
45 - 49	4
40 - 44	4
35 - 39	8
30 - 34	5
25 - 29	2

(Average Age 43)

RANK DISTRIBUTION
March 1, 1976

Rank	No.
Professor	14
Associate Professor	11
Assistant Professor	9

YEARS OF FACULTY SERVICE DISTRIBUTION
March 1, 1976

Years	No.
30 - 34	2
25 - 29	4
20 - 24	1
15 - 19	2
10 - 14	4
5 - 9	11
0 - 4	10

(Average Years of Service 11.8)

FACULTY

DEPARTMENT OF HORTICULTURE

MARCH 1, 1976

Name Year Appointed (Current Rank)	Degrees	Assignment R	 T	 E	Area of Specialization
Alban, E. K. 1946 (Professor)	BA, Denison '36 MS, OSU '43 PhD, OSU '45	15	85	-	Commercial Veg. Production and Weed Control
Bauerle, W. L. 1970 (Assist. Prof.)	BS, Del Val '64 MS Rutgers '66 PhD, Cornell '70	100	-	-	Commercial Greenhouse Vegetable Crop Prod.
Berry, S. Z. 1967 (Assoc. Prof.)	BS, Cornell '52 MS, UNH '53 PhD, U of Cal. '57	100	-	-	Processing Tomato Variety Development
Blake, R. C. 1973 (Adj. Assoc. Prof.)	BS, U of Maine '49 PhD, U of Minn. '54		USDA		Pear Breeding
Brooks, W. M. 1958 (Assoc. Prof.)	BS, OU '54 MS, OSU '57	-	-	100	Comm. Outdoor and Greenhouse Veg. Crop Production
Buscher, F. K. 1956 (Assoc. Prof)	BS, OSU '50 MS, OSU '65	-	- (Area Agent)	100	Nursery Crop Production
Cahoon, G. A. 1963 (Professor)	BS, Utah SU '50 PhD, U of Cal '54	60	-	40	Grape Prod. & Tree Fruit Nutrition
Caldwell, J. L. 1955 (Professor)	BS, OSU '53 MS, OSU '54	-	-	100	Landscape Hort.-Home Grounds
Crean, D. C. 1969 (Assoc. Prof.)	BA, U of Cambridge '60 MA, U of Cambridge '66 PhD, OSU '69	50	50	-	Food Tech.-Chem. Comp. of Hort. Crops
Donoho, C. W. Jr. 1960 & 1973 (Professor)	BS, U. of Ken. '52 MS, U. of N. Car. '58 PhD, Mich. State U. '60		Assoc. Director O.A.R.D.C.		Pome Fruit Prod.
Ferree, D. C. 1971 (Asst. Prof.)	BS, Penn State '65 MS, U of Maryland '68 PhD, U of Maryland '69	100	-	-	Pome Fruit Prod.

Name Year Appointed (Current Rank)	Degrees	Assignment R	 T	 E	Area of Specialization
Fretz, T. A. 1972 (Assist. Prof.)	BS, U. of Maryland '64 MS, U. of Del. '66 PhD, U. of Del. '70	40	60	-	Nursery Crop Prod.- Propagation, Weed Control-Chemotaxonomy
Gallander, J. F. 1963 (Professor)	BS, OSU '60 PhD, OSU '64	100	-	-	Food Technology Fruit Products-Enology
Geisman, J. F. 1958 (Professor)	BS, OSU '55 MS, OSU '56 PhD, OSU '58	50	50	-	Food Technology Waste Utilization
George, W. L., Jr. 1971 (Assoc. Prof.)	BS, Del Val '60 MS, Rutgers '62 PhD, Rutgers '66	60	40	-	Greenhouse Vege- table Variety Development
Gould, W. A. 1947 (Professor)	BS, U of N.H. '42 MS, OSU '47 PhD, OSU '49	50	50	-	Food Tech.- Vegetable Products
Hartman, F. O. 1948 (Professor)	BS, U. of Toledo '37 MS, OSU '41 PhD, OSU '51	15	85	-	Fruit Production
Hill, R. G., Jr. 1950 (Professor)	BS, U of Maryland '45 MS, U of Maryland '48 PhD, U of Maryland '50	75	10	15	Assoc. Chairman - Fruit Culture
Kawase, M. 1966 (Professor)	BA, U of Tokyo '51 MA, U of Tokyo '54 MS, U of Minn '58 PhD, Cornell '60	100	-	-	Plant Propagation
Kiplinger, D. C. 1941 (Professor)	BS, Iowa SC '37 MS, OSU '38 PhD, OSU '52	20	80	-	Floral Crop Production
Kozel, P. C. 1968 (Assoc. Prof.)	BS, OSU '63 MS, OSU '65 PhD, Cornell '67	25	75	-	Landscape Hort. Plant materials
Kretchman, D. W. 1963 (Professor)	BS, MSU '53 MS, MSU '54 PhD, MSU '58	70	30	-	Processing Veg. Crop Production
Mosley, A. R. 1971 (Assist. Prof.)	BS, U of K '65 MS, U of K '68 PhD, Ore. SU '72	60	-	40	Potato and Fresh Market Veg. Production

Name Year Appointed (Current Rank)	Degrees	Assignment R	 T	 E	Area of Specialization
Peng, A. C. 1958 (Assoc. Prof.)	BS, WSU '61 MS, MSU '62 PhD, MSU '65	50	50	-	Food Tech-Flavor- Soy Protein Foods
Poole, H. A. 1974 (Assist. Prof.)	BS, U of Florida MS, U of Florida '71 PhD, Cornell '74	55	-	45	Floral crop Production
Reisch, K. W. 1956 (Professor)	BS, U of Conn. '52 MS, OSU '53 PhD, OSU '56	(Assoc. Dean Col. of Agr.)			Landscape Hort.
Robertson, J. L. 1974 (Assist. Prof.)	BS, Purdue '70 MS, Purdue '72 PhD, Purdue '74	30	70	-	Horticulture Marketing-Management
Rollins, H. A., Jr. 1970 (Professor)	BS, U of Conn. '50 MS, U of NH '51 PhD, OSU '54	25	50	25	Department Chairman
Smith, E. M. 1967 (Assoc. Prof.)	BS, U of Conn. '58 MS, OSU '64 PhD, OSU '67	25	-	75	Nursery Crop Prod.
Smith, R. C. 1973 (Assist. Prof.)	BS, U. of Ga. '69 MS, U. of Ga. '71 PhD, OSU '73	-	100	-	Landscape Hort.- Landscape contracting
Staby, G. L. 1970 (Assoc. Prof.)	BS, U of Conn. '66 MS, MSU '67 PhD, MSU '70	75	-	25	Post-Harvest Hort.- Floral Crops
Stang, E.J. 1974 (Assist. Prof.)	BS, KSU '67 MS, Iowa SU '69 PhD, Iowa SU '73	-	-	100	Tree & Small Fruit Crop Production
Sydnor, T. D. 1972 (Assist. Prof.)	BS, VPI '62 MS, NCS '69 PhD, NCS '72	50	50	-	Nursery Crop Prod.- Plant Growth Regulators
Tayama, H. K. 1964 (Professor)	BS, U of Ill. '58 MS, U of Ill. '59 PhD, OSU '63	10	-	90	Floral Crop Prod.
Utzinger, J. D. 1967 (Assoc. Prof.)	BS, OSU '54 MS, OSU '58 PhD, OSU '59	-	25	75	Veg. Crop Prod. Youth Programs
Wittmeyer, E. C. 1950 (Professor)	BS, OSU '48	-	-	100	Processing Vegetable Crop Production
(Vice White)	-----	-	-	100 (Area Agent)	Gen. Hort.-emphasis Proc. Veg. Crop Prod.

DEPARTMENT OF HORTICULTURE
DISTRIBUTION OF FACULTY TIME
March 1, 1976

Floriculture-Commercial	Teaching	Research	Extension	Total
Kiplinger	.80	.20	--	
Poole	--	.55	.45	
Robertson	.70	.30	--	
Staby	.25	.75	--	
Tayama	--	.10	.90	
	1.75	1.90	1.35	5.00
Food Technology-Commercial				
Crean	.30	.50	--	
Gallander	--	1.00	--	
Geisman	.20	.50	--	
Gould	.50	.50	--	
Peng	.50	.50	--	
	1.50	3.00		4.50
Landscape Horticulture-Commercial				
Fretz	.30	.40	--	
Kawase	--	1.00	--	
Kozel	.75	.25	--	
Smith, E.	--	.25	.75	
Smith, R.	.30	--	--	
Sydnor	.50	.50	--	
	1.85	2.40	.75	5.00
Pomology-Commercial				
Cahoon	--	.60	.40	
Ferree	--	1.00	--	
Hartman	.45	.15	--	
Hill	--	.25	.15	
Stang	--	--	1.00	
	.45	2.00	1.55	4.00
Vegetable Crops-Commercial				
Alban	.40	.15	--	
Bauerle	--	1.00	--	
Berry	--	1.00	--	
Brooks	--	--	1.00	
George	.20	.60	--	
Kretchman	.15	.70	--	
Mosley	--	.60	.40	
Wittmeyer	--	--	1.00	
	.75	4.05	2.40	7.20

DEPARTMENT OF HORTICULTURE
DISTRIBUTION OF FACULTY TIME
Continued

General Hort.	Teaching	Research	Extension	Total
Alban	.45	--	--	
Caldwell	--	--	1.00	
Crean	.20	--	--	
Fretz	.30	--	--	
George	.20	--	--	
Geisman	.30	--	--	
Hartman	.40	--	--	
Kretchman	.15	--	--	
Smith, R.	.70	--	--	
Utzinger	.25	--	.75	
	2.95		1.75	4.70

Administration	General			
Rollins	1.00	--	--	
Hill	.60	--	--	
	1.60			1.60

Does not Include:

Blake - USDA - Pear Breeding Program
Buscher - Area Agent - Horticulture

DISTRIBUTION OF DEGREES EARNED BY DEPARTMENT OF HORTICULTURE FACULTY

Institution	No. of Degrees Attained
The Ohio State University	32
University of Maryland	6
Michigan State University	6
Cornell University	4
Rutgers University	3
University of New Hampshire	3
Iowa State University	3
Purdue University	3
University of Connecticut	3
Delaware Valley College	2
University of California	2
University of Cambridge	2
University of Delaware	2
University of Tokyo	2
University of Minnesota	2
North Carolina State University	2
University of Kentucky	2
Washington State University	2
University of Illinois	2
Clemson University	2
Ohio University	1
Utah State University	1
Penn State University	1
University of Toledo	1
Oregon State University	1
South Dakota State University	1
Virginia Polytechnic Institute & State University	1
Kansas State University	1

FACULTY INVOLVEMENT

Because of the major interrelationships that exist between the department, its faculty and the dynamic industries served, departmental faculty have major responsibilities for numerous short courses, schools, seminars, etc. Among the more significant meetings organized and developed by department faculty during 1975 are as follows:

1. Florist Short Course
2. Nurseryman's Short Course
3. Ohio State Horticultural Society Annual Meeting
4. Ohio Vegetable and Potato Growers Annual Meeting
5. Ohio Canners and Food Processors Association Annual Meeting
6. Small Fruits Day
7. International Dwarf Fruit Tree Tour
8. Summer Tour - Ohio State Horticultural Society
9. Summer Meeting - Ohio Florist Association
10. International Taxus Symposium
11. Fruit School
12. Potato School
13. Turf and Landscape Day
14. Shade Tree Day
15. Lane Avenue Open House
16. Greenhouse Vegetable Day

Because of the scope and depth of programs presented, a number of these meetings have taken on the flavor of national meetings of industry leaders. For example, the Ohio Florist Short Course, as well as the Ohio Nurserymans Short Course will typically have in excess of 1,000 people participating from throughout the country.

SUPPORT PERSONNEL

The department is fortunate to have a strong knowledgeable, skilled and dedicated group of people working in its laboratories, greenhouses, research plots, and offices. At present 51 percent of the supportive group are women. There are 11 BS degree, 2 MS degree, and 2 AAS degree people working in this group. Of the 49 assigned support positions, 8 are presently "frozen".

FTE DEPARTMENTAL SUPPORT POSITION

	Columbus			Wooster			Total	
	OSU	CES	OARDC	OSU	CES	OARDC	Assigned	Frozen
Clerical	3.9	4.2	0.9	---	---	2.0	11.0	---
Technical	0.5	1.0	6.5	---	---	11.0	19.0	2.0
Ghse Personnel	2.0	---	---	---	---	4.5	6.5	1.5
Field	3.0	---	1.0	---	---	7.5	11.5	4.5
Pilot Plant	0.5	---	0.5	---	---	---	1.0	---
TOTAL							49.0	8.0

RESEARCH PROGRAMS

The research programs of the department have over the years been continually modified and adjusted to reflect the changing needs and opportunities of the Horticultural industries of the state. The programs have largely been mission oriented, but with considerable emphasis also directed toward the development of a clearer understanding of the various horticultural principals upon which future production concepts may be based.

In general, the research programs of the department may be divided into the following commodity areas, however, in many instances, specific research may be designed to provide information that would be useful in more than one commodity area. Faculty are encouraged, in addition to their specific designated area, to interact with and provide assistance to faculty working in other commodity areas.

1. Greenhouse Vegetables
2. Fresh Market Outdoor Vegetables including potatoes
3. Vegetables for Processing
4. Tree and Small Fruits
5. Food Technology
6. Landscape Horticulture
7. Floriculture

In the development of research programs increasing emphasis has been placed upon the team approach to research efforts with significant involvement with faculty from other departments and disciplines. Within the department there are several outstanding examples of interdisciplinary team research.

On the following pages an attempt will be made to briefly summarize the current programs underway in the various areas, as well as the anticipated future direction of the specific programs.

GREENHOUSE VEGETABLE CROPS

Ohio is the largest producer of greenhouse vegetable crops in the United States, with over 550 acres under cultivation. One-third of the total U.S. greenhouse vegetable acreage is in Ohio. Ohio's industry has an annual farm value of some $18 million. The Ohio greenhouse vegetable acreage is relatively stable at the present. However, with competition from imports from Mexico, the greenhouse vegetable industry, as well as the winter fresh market industry in the U.S., faces a major challenge. The limited supplies of conventional sources of energy for heating greenhouses is likewise creating major problems for the industry.

It is expected that the greenhouse vegetable industry can remain strong and viable. However, this will require significant refinements in production efficiencies, and a reduction in the requirements for conventional sources of energy. A high degree of advanced technical production know-how currently exists within the industry. The Ohio industry also has a strong and well organized marketing system, under the guidance of progressive and well informed leadership. In the past aggressive research programs and the rapid adoption of new techniques have been important factors in the growth and stability of the industry. It is apparent that continued advanced, visionary research is needed if Ohio greenhouse vegetable growers are to remain in a strong competitive position. The industry can compete with imports only if it continues to produce high quality produce for those that are educated to and willing to pay for quality tomatoes and other greenhouse vegetables.

Research programs within the department to serve the needs of the greenhouse vegetable industry fall into two major areas--(1) the development of new production systems to further increase production efficiency and (2) the refinement of greenhouse vegetable cultivars to increase yields of quality produce under Ohio conditions. Progress in these areas is expected to increase production efficiencies sufficiently to offset the increasing costs of energy. Also an important phase of the total effort is that of seeking ways to reduce energy requirements under current systems and to develop visionary advanced production systems.

It is also important to note that the present total greenhouse vegetable program is fully integrated with those cooperative programs of other departments and disciplines. The following projects presently encompass the greenhouse vegetable research efforts of the department of Horticulture.

HATCH 445: GENETICS AND BREEDING OF GREENHOUSE VEGETABLE CROPS
(App 5/72-77)

Personnel: George-Farley (.50 S.M.Y. - 1.0 T.M.Y.)

Objectives:

1. Development of tomato cultivars adapted to greenhouse culture with:
   a. Improved fruit quality, increased yield, and larger fruit size.
   b. Multiple resistance to greenhouse disease.
   c. Tolerance or resistance to greenhouse insect pests.
   d. Tolerance to air pollutants.

2. Reduce production costs by breeding for increased pollination efficiency and a non-suckering vegetative growth habit.

Hatch 445: GENETICS AND BREEDING OF GREENHOUSE VEGETABLE CROPS (cont.)

3. Reduce harvesting costs by genetically retaining the calyx on the fruit and removing or shortening the pedicel.

4. Evaluation of lettuce and cucumber cultivars adapted to greenhouse cultural conditions.

The greenhouse tomato industry of Ohio is heavily dependent upon the Ohio Agricultural Research and Development Center for new and improved cultivars possessing disease resistance, high yielding and improved quality characteristics that can be utilized to reduce energy and labor inputs. This project is developed to satisfy these needs. Major progress is being achieved.

HATCH 483: IMPROVEMENT OF CULTURAL TECHNIQUES AND PRODUCTION EFFICIENCIES FOR THE GREENHOUSE TOMATO (App. 10/73-76)

Personnel: Bauerle (1.0 S.M.Y. - 1.0 T.M.Y.)

Objectives:

1. To ascertain the interrelationship of environmental factors such as light, temperature, ambient CO_2, relative humidity, and soil type, on yield and fruit quality of the greenhouse tomato.

2. To determine the influence of environmental factors upon tomato pollen quality and methods of pollination and to determine the effect of these factors on fruit quality.

3. To determine the influence of growth regulators on plant growth, fruit set, fruit development, ripening and quality.

4. To determine a method of producing transplants capable of being mechanically planted.

5. To determine the influence of plant density and type of cropping system on plant growth, yield, and quality of the greenhouse tomato and to develop cultural technology for mechanization of the present high labor requiring practices of planting, pollination and harvesting of tomatoes.

This project encompasses work underway to refine greenhouse tomato production techniques and to provide "building blocks" for the development of totally new concepts presently under consideration. An additional project is being prepared. This project will encompass refined production concepts for greenhouse vegetable crops other than tomatoes.

OUTDOOR FRESH MARKET VEGETABLES INCLUDING POTATOES

Ohio is uniquely suited to the commercial production of many different vegetable crops. There exists a wide range of climatic conditions within the state and soils vary from "light" sands to muck. Producers are located in close proximity to major markets making several marketing procedures and opportunities possible. There are over forty different vegetables grown commercially in Ohio.

In many regions of the country the vegetable industry is concentrated in relatively confined areas with only a few crops involved. In Ohio the reverse is the situation. The climate in southern Ohio is similar to that found in North Carolina and Tennessee, whereas the climate in northeastern Ohio is similar to New York and other northeastern states. While the varied climates and soils provide unique opportunities for the production of many different vegetable crops, it also results in the need for research with numerous vegetable crops to satisfy the need for advanced technological information.

Potatoes rank second only to processing tomatoes, among the vegetable crops produced commercially in Ohio. While potatoes are sold fresh, many are are sold to "chippers" for the manufacture of potato chips. Presently forty to fifty percent of Ohio's annual production is estimated to be used for potato chips.

The fresh market vegetable producers are not without problems. There is a critical need to increase production efficiency with primary emphasis placed upon labor efficiency through the development of new and imaginative cultural systems. There is also need to produce crops of ever increasing quality and to develop systems of handling and marketing to insure that the product reaches the consumer at the optimum stage of quality. New cultivars are being introduced each year. If Ohio producers are to satisfactorily compete with producers from other areas, it is essential that there be available to them up-to-date information relative to specific attributes of new cultivars as well as their specific adaptations to Ohio's growing conditions.

Because of the high population density that exists within close proximity to suitable producing areas, there are opportunities to further expand and develop fresh market vegetable production in Ohio.

The following are those active projects in this area. It is recognized that there is need for greater research emphasis in fresh market vegetable production if the full potentials are to be realized.

HATCH 487: EFFECTS OF PLANT POPULATION, CULTURAL PRACTICES AND CULTIVAR ON YIELD AND QUALITY OF POTATOES (App. 5/74-77)

Personnel: Mosley-Wittmeyer (.50 S.M.Y. - .34 T.M.Y.)

Objectives:

1. To determine the influence of plant population and spacing arrangement on yields, grade, tuber size and growth responses.

2. To determine optimum nutritional and cultural requirements for high density potato production.

3. To ascertain the influence of population on tuber resistance to mechanical injury and on tuber quality and suitability for processing.

Hatch 487: EFFECTS OF PLANT POPULATION, CULTURAL PRACTICES AND CULTIVAR ON YIELD AND QUALITY OF POTATOES (cont.).

4. To determine the ideal planting distance and cultural practices to maximize the potential value of superior new cultivars and selections.

5. To determine the potential value of new potato cultivars and advanced selections for processing and fresh market use in Ohio.

This program encompasses the various cultural studies that are being conducted to further refine production systems as well as develop techniques to enhance potato production efficiencies. This work is integrated with studies (Hatch 463) relating to storage, reconditioning and processed product quality. The cultivar evaluation phase of this program is conducted on producer farms and to a significant degree supported by the Ohio Potato Growers Association.

HATCH 513: CULTURAL AND CHEMICAL WEED CONTROL METHODS IN HORTICULTURAL CROPS (App. 9/74-79)

Personnel: Alban, Fretz and Hill (.22 S.M.Y. - .45 T.M.Y.)

Objectives:

1. To determine the efficacy of new herbicides, new herbicide combinations, and the integration of chemical plus non-chemical weed control methods for control of weeds in horticultural crops for Ohio.

2. To determine the possible effects of continuous use of herbicides on crop yields and quality, changes in major weed specie problems, and effect on subsequent crops.

3. To determine cultivar response to various herbicides, particularly as related to major horticultural crops grown in Ohio.

The various individual studies involving the evaluation of chemical weed control procedures on various horticultural crops, including fruits, vegetables and ornamentals, are included under this project. A very important practice in the production of vegetable crops is that of weed control. Increasing attention is being directed towards the cultivar differences with respect to tolerance to herbicides.

STATE 444: EVALUATION OF PROMISING CULTIVARS AND SELECTIONS OF CERTAIN VEGETABLE CROPS FOR FRESH MARKET (App. 9/72-77)

Personnel: Alban, Mosley, George, Brooks, Utzinger
(.31 S.M.Y. - .25 T.M.Y.)

Objectives:

1. To evaluate and compare the relative merits of promising new cultivars and advanced selections of sweet corn, tomatoes, bell peppers, lettuce, celery and other vegetables to cultivars commonly grown in the state.

State 444: EVALUATION OF PROMISING CULTIVARS AND SELECTIONS OF CERTAIN VEGETABLE CROPS FOR FRESH MARKET (cont.)

2. To compile experimental evidence upon which to base recommendations to Ohio growers.

3. To compare methods of varietal evaluation in order to determine and select those procedures offering greatest efficiency and reliability.

The evaluation of cultivars and the rapid disemination of results to producers is an important phase of any vegetable research effort. However, caution is being exercised to limit the scope of individual trials to insure maximum results in terms of effort expended. Extension faculty and research faculty are involved cooperatively in the cultivar evaluation studies to insure the rapid diseminations of results and to further facilitate producer imputs.

PROCESSING VEGETABLE CROPS

The production of processing vegetable crops is a major industry within the state. Ohio ranks second only to California in acreage and value of tomatoes grown for processing. In 1975 Ohio producers grew 24,100 acres of processing tomatoes with an average yield of 17.6 tons per acre, and a farm value of $28,654,000. This accounts for an excess of one-third of the total annual cash value of all vegetables grown in the state.

There has also been significant increases in the production of cucumbers for pickles. In 1975 there were 6,900 acres of cucumbers harvested with a value of $9,238,000. It is anticipated that an upward trend will continue.

Prior to 1965 all of Ohio's processing tomatoes were picked by hand. Grower trials with mechanical harvesters started in that year. Approximately 2,500 acres were mechanically harvested the fall of 1975. The adoption of mechanical harvesting techniques has not progressed as rapidly as originally anticipated. The slow adoption of mechanical harvesting has been attributed to adverse weather conditions during the harvest period and other technological difficulties. It is conceeded that if the Ohio industry is to remain viable and in a strong competitive situation, problems associated with full mechanization must be solved. This will necessitate continued development of improved cultivars and the refinement of cultural systems as well as advances in tomato sorting and an extension of the harvest season to increase efficiency in processing plant facilities.

An important phase of the total processing vegetable research effort in Ohio is that of evaluating results on the basis of final processed product. Consequently there is a very close relationship between the field phases of the processing vegetable research and the processing segment of the total program. Current departmental strengths lie in the fact that the facilities and technical know-how exist within the department to carry the program from the field through to the final product.

The following are those projects currently active within the department to serve the raw product needs of the processing vegetable interests of the state.

HATCH 484: DEVELOPMENT AND EVALUATION OF IMPROVED MECHANICALLY HARVESTABLE PROCESSING TOMATOES (App. 3/74-79)

Personnel: Berry-Gould (1.0 S.M.Y. - .60 T.M.Y.)

Objectives:

1. To develop a series of mechanically harvestable whole-pack type tomatoes for the Ohio canning industry which possess:

   a. A series of maturities from early to mid-season with emphasis on early season.
   b. Concentrated ripening of fruit with uniform maturity.
   c. Fruits which are resistant to environmental moisture cracking and breakage through mechanical handling.
   d. Varieties which will permit vine storage of mature fruit.
   e. Productivity equivalent to present standards.
   f. Fruit with small core and adaptable lye peeling.
   g. Resistance to Fusarium and Verticillium wilts.

Hatch 484: DEVELOPMENT AND EVALUATION OF IMPROVED MECHANICALLY HARVESTABLE PROCESSING TOMATOES (cont.)

Additional characteristics desirable in such material would be good seedling vigor, wide adaptability particularly in regard to fruit setting ability, jointless pedicel (j2) with free-stemming characteristics; fruit processing improved levels of pH, acid, solids and with reference to processed whole-pack product, high levels of drained weight, wholeness and color.

2. To determine the climatic and adaphic adaptability of introductions from this program and from other breeding programs for the processing industry of northwestern Ohio with special emphasis on yield, suitability for mechanical harvest and quality of the raw and finished product.

This program represents major research emphasis of the department. Excellent progress is being made. Three new tomato cultivars have been introduced and several others show significant promise. Work in this area is fully integrated with processed product evaluation and cultural studies.

HATCH 464: CULTURE AND PHYSIOLOGY OF TOMATOES FOR PROCESSING (App 7/72-77)

Personnel: Kretchman, Short, Gould (.50 S.M.Y. - .70 T.M.Y.)

Objectives:

1. To establish optimum population density and plant arrangement for maximum yields of high quality fruit for once-over mechanical harvest from transplanted and direct seeded plantings on fine and coarse textured soils.

2. To determine the relationships of plant nutrition, fertilizer placement, soil types, vine training, weed control and plant population of transplanted and direct seeded tomatoes to plant growth, maturity, yield and process fruit quality for once-over mechanical harvest.

3. To determine the influence of physical and physiological seed characteristics and environmental factors on vigor, uniformity and stand establishment of direct seeded tomatoes.

4. To determine the influence of seedling density of southern-grown transplants on subsequent yield, maturity and fruit quality in Ohio.

5. To determine the influence of planting schedule and growth regulators on earliness, yield and fruit quality for once-over mechanical harvest.

If the processing tomato industry is to remain vigorous in Ohio, every effort must be made to facilitate maximum mechanization adapted to Ohio conditions. In the development of the specifics relating to this area of research there continues to be a close interaction between potentially promising engineering principles, processing plant needs and the needs of the raw product producer. Industry involvement is sought and considered very important.

HATCH 470: CULTURE AND PHYSIOLOGY OF CUCUMBERS FOR PROCESSING (App 4/73-78)

Personnel: Kretchman-Geisman (.20 S.M.Y. - .30 T.M.Y.)

Objectives:

1. To determine optimum nutritional, plant spacing, density and cultivar relationships for maximum yields for once-over and multiple-pick mechanically harvested cucumbers.

2. To determine the factors associated with planting schedules, plant emergence, seed viability, growth rate, growth regulators and harvest maturity for maximum yields and returns for mechanical harvesting.

3. To determine the influence of cultural practices, mechanical harvesting and post-harvest handling on processed quality of fresh pack and brine stock cucumbers.

The production of cucumbers for processing has increased dramatically in Ohio in recent years. Most of the acreage is currently hand-harvested in part due to the inter-relationship with processing tomato production systems. The refinement in the harvest mechanization of cucumbers under Ohio conditions is needed to provide the opportunity to adjust rapidly should there occur a shift in other factors making mechanical harvesting essential. This work is interrelated with work of the processing segments of the total efforts.

TREE AND SMALL FRUITS

THE INDUSTRY

Ohio is well suited to the production of various tree and small fruit crops. Although there are a number of highly specialized fruit farms, many producers raise a wide variety of fruit crops which can be marketed locally. There appears to be, at present, a regeneration of interest within the fruit industry of the State. One of the principle advantages Ohio fruit producers have is their close proximity to major markets.

Ohio growers typically produce between 3 and 4 million bushels of apples annually. The industry is characterized by "smaller" producers widely distributed over the state. This creates problems in terms of satisfying the demands of large volume buyers because of the inability of many producers to offer sufficient volumes of one cultivar, of one size, and of one grade and in a specified type of container. The distribution of the industry and the concentration of population does, however, offer unique opportunities for local market retail farm sales, and pick-your-own operations to supplement wholesale sales.

It is projected that there are opportunities for the increased production of apples for the wholesale markets providing imaginative and cooperative efforts are further developed and providing there are increased efforts to produce higher proportions of superior quality fruit. It is also projected that there are opportunities to increase the profitable production of apples for "pick-your-own" and for retail farm sales providing new concepts of efficient production of quality fruit are developed and adopted.

Ohio orchardists normally produce one-half million bushels of peaches. There are markets within the state that will insure Ohio growers a good profit for many more peaches then are currently being produced. One of, if not the major problems confronting Ohio peach producers, is tree and blossom bud damage from low temperature extremes. The future potential of the peach industry in the state is likely to be dependent upon the success that is attained in minimizing the losses experienced from low temperature damage. There is also increasing interest among Ohio producers in the production of nectarines.

Small fruits, particularly strawberries, offer opportunities for increased production in the state. The major opportunities exist in pick-your-own operations as well as retail farm sales. It is also recognized that, as Ohio producers move in the direction of retail farm sales, opportunities for greater diversity in the types of fruit as well as vegetable crops grown exists.

The production of grapes for wine as well as for fresh consumption offers significant potentials for growth and expansion throughout Ohio. The climate is generally suitable, production know-how exists, and there are well established research and educational programs underway. Additional refinements in production techniques are needed with particular emphasis on increasing labor efficiency. More information is also needed as to the most desirable cultivars to produce under Ohio conditions. There are also opportunities to expand the production of sweet and tart cherries, pears and plums.

RESEARCH PROGRAMS

Research programs in the fruit crop area have been adjusted in recent years to place major emphasis on the following areas--(1) the development of intensive systems of tree fruit culture to increase production efficiency, minimize labor requirements, improve product quality, and increase per unit profits, (2) mineral nutrition of deciduous tree fruits to insure maximum fruit quality and productivity, (3) grape production refinement techniques and studies relating to the utilization of grapes, (4) overall fruit cultivar evaluation for ohio conditions, (5) pear breeding in cooperation with the U.S.D.A., (6) herbicide studies, (7) studies relating to those factors influencing carbohydrate synthesis within apple foliage, (8) the breeding and development of thornless blackberries in cooperation with the U.S.D.A.

Work with apple breeding, chemical fruit thinning, and storage of tree fruits has been reduced in order to increase emphasis in areas where increased research is needed. These are also areas where much information can be obtained from active programs in nearby states. Major extension efforts in the dissemination of chemical thinning and fruit storage information is underway to capitalize upon the information already available. It is recognized that there are additional problems and opportunities not encompassed in current research efforts. Additional research needs include greater emphasis on techniques to minimize low temperature in stone fruit losses.

There exists excellent cooperation with the department of Plant Pathology, Entomology, Agronomy, Agricultural Economics and Agricultural Engineering. This cooperation and continued coordination is essential if the industry is to receive maximum benefits from the resources expended. The following are those horticultural projects currently active within the fruit area.

HATCH 421: DEVELOPMENT AND EVALUATION OF INTENSIVE APPLE PRODUCTION SYSTEMS (App 3/72-77)

Personnel: Ferree-Rollins (.80 S.M.Y. - .60 T.M.Y.)

Objectives:

1. Develop and evaluate the efficiencies of various management systems for high density orchards.

2. Determine the influence of selected fertilizer, nematicide, and irrigation practices on growth and development of dwarf apple trees and develop optimum procedures for commercial practice.

3. Investigate methods of minimizing the labor required for pruning and to evaluate the influence of pruning methods on "within tree" light relations and fruit quality.

4. Develop and refine techniques to reduce the establishment cost of high density orchards.

5. Ascertain the effect of size controlling rootstocks and interstocks on the growth, yield and fruit quality of selected apple cultivars.

Hatch 421: DEVELOPMENT AND EVALUATION OF INTENSIVE APPLE PRODUCTION SYSTEMS(cont.)

This research effort is designed to bring together existing technologies relating to intensive high density apple production techniques into a total production system. Previous work in Ohio has provided a wealth of background data. The present effort is capitalizing on these data and also filling voids as the total system emerges.

HATCH 479: INFLUENCE OF PESTICIDES ON PHYSIOLOGICAL PROCESSES OF APPLE TREES (App 8/71-76)

Personnel: Ferree (.20 S.M.Y. - .10 T.M.Y.)

Objectives:

1. Determine the influence of selected fungicides, insecticides, and growth regulators on the carbon dioxide assimilation rate of apple trees grown on selected roostocks.

2. Ascertain the effects of protective chemicals on growth and nutrient levels of apple trees and fruit.

3. Develop and refine instrumentation and techniques to accurately measure carbon dioxide assimilation of individual apple leaves.

Too frequently it is assumed that if chemical sprays or other treatments do not result in visable phytotoxicity, there has been no damage. However, there are indications that CO_2 assimilation may be reduced without visable signs of phytotoxicity. Several useful findings have emerged from this work to date and consideration is being given toward broadening the scope of the effort and studying various factors that may limit carbohydrate synthesis and hence, have an adverse influence on production efficiency in other horticultural commodities.

HATCH 474: DEVELOPMENT AND EVALUATION OF SYSTEMS FOR INTENSIVE PRODUCTION OF STONE FRUITS (App 4/73-78)

Personnel: Hartman-Hill (.20 S.M.Y. - .20 T.M.Y.)

Objectives:

1. To evaluate the effect of planting distances and their relationship to growth, yield, cultural practices and labor requirements of the various stone fruits grown on available rootstocks.

2. To evaluate the potential of available rootstocks for reducing tree size in high density plantings especially suited to pick-your-own marketing.

3. To develop techniques for efficient asexual propagation of such rootstocks.

4. To develop and evaluate the efficiencies of various management systems for high density stone fruit plantings designed for pick-your-own harvest.

This project largely encompasses high density peach and cherry production concepts currently under study at the Jackson and Mahoning Branches. Summer pruning techniques are currently underway to retain trees within bounds. Cooperative greenhouse studies relating to the development of asexual production of stone fruit rootstocks are also underway at both Wooster and Columbus.

HATCH 526: MINERAL NUTRITION OF SELECTED DECIDUOUS FRUIT CROPS (App. 5/75-80)

Personnel: Cahoon (.25 S.M.Y. - .40 T.M.Y.)

Objectives:

1. To ascertain the effects of differential rates and combinations of fertilizers on growth, chemical composition, productivity and harvest maturity of apples and peaches on seedling and size-controlling rootstocks and grape on disease resistant and cold tolerant roostocks.

2. To determine optimum nutritional levels of new strains and cultivars of deciduous fruit trees and grapes; also those plants whose physiology and growth habit has been modified by chemical growth regulators.

3. To determine the effects of new fertilizer formulations, such as slow-release nitrogen and foliar applied nutrients plus surfactants and adjuvants, as a means of correcting nutritional disorders and supplying nutrients in a form most compatable with fruit plant requirements and the environment.

This project represents a long time departmental emphasis and is contributing to our understanding of plant nutrition and factors that may exert influences upon tree growth and productivity.

STATE 438: EVALUATION OF PROMISING PEAR SELECTIONS AND CULTIVARS FOR OHIO (App. 4/72-77)

Personnel: Rollins-Blake (.10 S.M.Y. - .20 T.M.Y.)

Objectives:

1. To determine the performance of promising pear cultivars and selections under Ohio growing conditions.

2. To determine the performance of especially promising pear cultivars and selections on various size controlling rootstocks.

This project relates to the major effort that the U.S.D.A. has underway in cooperation with the O.A.R.D.C. and the Department of Horticulture. The total effort is designed to develop pear cultivars that would be resistant to fireblight. Such cultivars could make possible the development of a major pear industry in the Eastern U.S.

HATCH 442: INFLUENCE OF CLIMATE AND SELECTED CULTURAL PRACTICES ON GROWTH, PRODUCTION AND QUALITY OF GRAPES (App 5/72-77)

Personnel: Cahoon (.35 S.M.Y. - .70 T.M.Y.)

Objectives:

1. To evaluate the effects of promising rootstocks on the growth, adaptation and productivity of grape cultivars.

2. To ascertain the suitability and special cultural requirements of grape cultivars in Ohio.

3. To improve the efficiency of pruning, training and trellising techniques on selected grape cultivars, with special emphasis on the use of mechanical aids.

4. To determine the effects of selected chemical growth regulators on the development and productivity of grapes.

There exists the potential for significant growth and expansion of the grape industry of Ohio. This program encompasses that work that relates to the refined cultural techniques to facilitate the further development of the industry.

HATCH 485: EVALUATION OF PROMISING SELECTIONS AND CULTIVARS OF CERTAIN TREE AND SMALL FRUITS FOR OHIO (App. 4/74-79)

Personnel: Hill, Ferree, Stang, Rollins (.20 S.M.Y. - .35 T.M.Y.)

Objectives:

1. To ascertain the relative merits in comparison with accepted commercial cultivars, of promising selections and new cultivars of certain tree and small fruits.

2. To obtain experimental evidence upon which to base varietal recommendations for the fruit growers of Ohio.

3. To develop and compare methods of cultivar evaluation in order to determine those that are most expedient, reliable, and efficient.

4. To supply fruits of those cultivars and selections which exhibit superior growth and yield characteristics for the determination of the possible value of these fruits for processing.

While this area of research is not a major thrust of the department, it is important that data be collected and disseminated to assist fruit producers in making wise decisions in cultivar selection. Such decisions often represent the major factor in the future success or failure of a fruit production enterprise.

STATE SPECIAL 229: BREEDING THORNLESS BLACKBERRIES FOR WINTER HARDINESS AND IMPROVED HORTICULTURAL CHARACTERISTICS (App. 6/74-78)

Personnel: Hill-Blake (.10 S.M.Y. - .10 T.M.Y.)

Objectives:

1. Originate winter hardy, thornless blackberries with desirable horticultural characteristics.

2. Originate thornless blackberry breeding lines and cultivars at different polyploid levels.

3. Determine inheritance of characters of blackberries.

4. Develop techniques to obtain increased germination of seeds of blackberries.

5. Develop methods for screening and evaluation of breeding materials for winter hardiness.

This program is largely a U.S.D.A. effort, but developed in cooperation with the O.A.R.D.C. and the Department of Horticulture.

FOOD TECHNOLOGY

The fruit and vegetable processing industries represent a very significant segment of the total horticultural industries of Ohio. They add in excess of $1 billion annually to the value of the raw products produced on Ohio farms. This segment of the industry employs 85,000 men and women during the peak of the canning season and contributes significantly to the total economy of the state.

Tomatoes are the leading processed food in Ohio. Ohio is the No. 1 state in the manufacture of tomato juice, the official state beverage. Tomatoes in Ohio are processed as whole tomatoes, juice, ketchup, paste, sauce and tomato pulp.

Potatoes are another important Ohio processed food. Potatoes are processed as chips, french fries, or dried and manufactured into potato starch. Chips are the most important potato processed product in Ohio. Ohio is increasing in importance as a producer of quality table wines and its wines are gaining in popularity.

Other important Ohio processed food items are green and lima beans, cherries, corn, jams, jellies, juice drinks, peas, pickles, pumpkin, sauerkraut and many specialty gourmet food items.

The food technology research emphasis of the department is as follows:

(a) processed various fruits and vegetables

1. To improve quality of processed products

2. To develop new processed products

3. To improve processing efficiency by developing new unit operations and refinements of existing unit operations.

4. To expand food processing operations for new and greater outlets of Ohio fruits, vegetables, and related crop products.

(b) development of new methods of quality assessments and evaluation of fresh and processed foods to enhance the acceptance of Ohio foods.

(c) improvement of nutritional values of processed foods by selection of higher quality raw materials, new processing methods, fortification practices and shelf-life handling.

(d) evaluation of production practices including evaluation of new varieties and cultivars for processed product quality improvement and efficiency.

Food technology facilities within the Department of Horticulture at The Ohio State University are some of the best available in the United States. The program underway has an excellent reputation and there are unique opportunities to expand programs to more adequately capitalize upon the opportunities that exist to further strengthen the food processing industries of Ohio.

The following are the current active research programs underway in the food technology area of the department.

HATCH 544: PROCESSING EFFICIENCY AND MARKET ACCEPTABILITY OF CULTIVARS OF TOMATOES FOR CANNING (App. 7/75-80)

Personnel: Gould and Berry (.15 S.M.Y. - .20 T.M.Y.)

Objectives:

1. To evaluate new cultivars; maturity within a cultivar; and mechanical harvesting, handling and sorting systems by cultivar on canned product quality and market acceptability of tomatoes and tomato products.

2. To evaluate unit operation of sorting (manual, water, electronic), washing, peeling, filling, and processing on canned tomatoes and on juice and concentrated tomato products manufactured as to effects on canned product quality and market acceptability.

3. To determine the ffect of food additives (acidulants, sweeteners, firming agents and spices) on quality and market acceptability for canned tomatoes, juice and concentrated tomato products.

Research in this area not only involves the evaluation of cultivars developed in Ohio but other tomato cultivars that may also offer promise for Ohio processors. In addition to cultivar evaluation various cultural systems under development are also evaluated for possible influences on the quality of the final processed product. Work is also under way with floatation sorting and other techniques to facilitate total development of the industry.

HATCH 463: FACTORS AFFECTING POST-HARVEST MARKET QUALITY OF PROCESSED POTATOES (App 7/73-78)

Personnel: Gould (.10 S.M.Y. - 1.0 T.M.Y.)

Objectives:

1. To identify and quantify pre and post-harvest conditions including storage and handling which affect the market quality of potatoes for processing.

2. Develop and apply processing technology to produce improved new potato products for the market.

Potato chips represent an important processed vegetable product in Ohio. The lack of uniformity of chip quality is a problem. Much of the work in this area is directed toward the solution of this problem. Potential for grant support may make it possible to increase emphasis in this area. The development of additional potato products are also under investigation.

HATCH 425: TECHNIQUES FOR DISPOSAL OF VEGETABLE PROCESSING PLANT WASTES (App 5/75-78)

Personnel: Geisman (.50 S.M.Y.)

Objectives:

1. To evaluate the use and reuse of spent brine for manufacture of cucumber pickles.

2. To reduce water use in processing both pickles and tomatoes.

3. To develop techniques for reducing or utilizing solid waste from vegetable processing plants.

The utilization of waste products from processing operations is becoming increasingly important. Research in this area is directed toward the development of the potentials that exist.

HATCH 396: LIPID CHANGES AS RELATED TO KEEPING QUALITY OF PROCESSED HORTICULTURAL FOODS (App 5/74-77)

Personnel: Peng (.50 S.M.Y.)

Objectives:

1. To determine the total lipid content, quantitative distribution of lipid classes, and their fatty acid composition present in the cucumber, grape and cabbage.

2. To investigate the changes in lipid composition and quality of the above horticultural products after storage and/or processing.

Flavor components of fruit and vegetable products and factors that effect these components are important to the quality of the finished product. Research in this area is an attempt to gain a better appreciation of the changes that may occur in flavor factors and how such changes can be subsequently modified.

HATCH 551: EFFECT OF CULTIVAR, POST-HARVEST AND PROCESSING VARIABLES ON NUTRIENT CONTENT OF SELECTED VEGETABLES (app. 9/75-78)

Personnel: Crean (.50 S.M.Y. - .00 T.M.Y.)

Objectives:

1. To examine differences in nutrient content of selected vegetable cultivars.

2. To investigate changes in the nutrient content of vegetables as affected by handling and storage conditions after harvest.

3. To examine the effects of processing variables on the nutrient content of vegetables.

Hatch 551: EFFECT OF CULTIVAR, POST-HARVEST AND PROCESSING VARIABLES ON NUTRIENT CONTENT OF SELECTED VEGETABLES (cont.)

The nutritional value of foods is receiving increased consideration, however, there are many voids in our understanding of those factors that may influence the various levels of nutrients in fruit and vegetable products. This work is a new undertaking in the department to gain a better understanding of specific nutrient levels in fruits and vegetables and those factors that may affect those levels.

HATCH 157-2: INFLUENCE OF NEW FRUIT SELECTIONS AND CULTIVARS ON PROCESSED PRODUCT QUALITY (App. 7/71-76)

Personnel: Gallander (.45 S.M.Y - .55 T.M.Y)

Objectives:

1. To ascertain the suitability of promising new fruit cultivars and selections for processing as indicated by the quality of the finished product.

2. To obtain experimental data upon which to base recommendations to Ohio growers, processors and consumers as to those cultivars most suitable for processing.

3. To determine the influence of various processing techniques and cultural practices on the quality of the finished products.

This project will be terminated June 30, 1976. A new project is being developed to encompass grape cultivar evaluation work from the standpoint of processed products and as the need arises the processing characteristics of other fruit cultivars. This new project will represent an important but not major emphasis area.

HATCH 441: IMPROVING THE QUALITY OF OHIO VARIETAL TABLE WINES BY THE INDUCTION OF MALO-LACTIC FERMENTATION (App 2/72-77)

Personnel: Gallander (.55 S.M.Y. - .35 T.M.Y.)

Objectives:

The general objective of this project is to improve the market quality of Ohio table wines by inducing malo-lactic fermentation. The specific objectives are as follows:

1. To investigate the effects of various vinification procedures on the induction of malo-lactic fermentation in certain varietal wines.

2. To determine the quality, chemically and sensory, of certain wines which have undergone malo-lactic fermentation.

3. To ascertain the occurrence of malo-lactic fermentation in commercial Ohio table wines.

The future development of the Ohio grape-wine industry will be dependent to a large degree upon the quality and reputation of Ohio wines. This project is designed to aid the state wineries in further improving quality.

STATE SPECIAL 221: UTILIZATION OF LAKE ERIE STOCKS OF FRESH WATER DRUM PROCESSING TECHNOLOGY (App. 7/74-12/76)

Personnel: Gould (.25 S.M.Y - .90 T.M.Y.)

Objective:

1. To expand and increase the market for processed Lake Erie freshwater drum.

This research is conducted in an attempt to develop new products that would provide significant market opportunities for Lake Erie freshwater drum as well as potatoes and tomatoes. As economically sound uses for drum are developed, interrelated research underway within the School of Natural Resources to improve the ecology of Lake Erie, will be enhanced. While this project is not typical of research conducted within the department, there does exist strong canning technology expertise involving horticultural materials within the department and there is the opportunity to successfully complete the assignment and consequently contribute significantly to the total mission of the College. An important facet of this program would be the creation of new uses for tomato, potato and possibly other horticultural commodities important to the state.

NURSERY-LANDSCAPE

Ohio ranks second in the United States in the production of nursery stock and it is projected that this segment of Ohio's horticultural industry has the strong potential to continue to expand. There is increasing emphasis being placed upon natural beauty and the quality of the environment. People are placing greater importance upon home landscaping and outdoor living areas. As people have more leisure time, many turn to the development of the home grounds as a recreational activity. The importance of parks, green areas within inner cities, and roofgardens, not to mention the increased indoor use of plants are also receiving increased recognition. All of these and other considerations point toward greater expanded opportunities for the production and utilization of ornamental plants.

It is significant that the wholesale value of nursery stock produced in Ohio is a very poor indicator of the total impact of this industry upon the state's economy. The goods and services segment of this total industry is significant and is expanding rapidly. In the future it is expected that there will be a further expansion of landscape design firms, garden centers, landscape maintenance companies, etc., as the use of plants in public and private areas increases.

There are changes taking place within the industry. Presently, 1/3 of all the nursery stock grown in Ohio is produced in Lake County. Urbanization is forcing relocation of some of the establishments to less densely populated areas. This same situation is also occurring in some other sections of the state. Production acreage has not decreased and marketing outlets continue to increase. Labor is a continuing problem because of the higher wage rates demanded and the seasonality of the business. More effort must be directed toward minimizing the labor requirement within the nursery industry if quality plants are to continue to be available to the consuming public at realistic yet profitable prices. This has been responsible for a trend toward the greater production of container grown stock and while opportunities exist in this area, innovative research is needed in techniques of over-wintering these plants. It is also important to indicate that many more container plants can be produced on a given area and productive field soils are not essential.

The production of nursery stock in Ohio has long been dependent on the length of the growing season. Increasing production costs dictate the need for greater dollar return per unit area in a shorter period of time. The feasibility of producing high quality woody plants for market more rapidly by using plastic structures has been explored and appears to have singificant potential in a production and marketing program. For example, it would be possible to reduce production time by 1/3 to 1/2 and also provide certain plants for forcing and sale on holidays during the winter months.

As the use of plant materials increases in smaller and more confined areas, there are needs and opportunities to tailor plants for specific uses within the landscape. Size, shape, form, and growth characteristics are all important. Through natural selection, breeding and chemical plant growth regulation, unique opportunities exist. More carefully organized programs for the evaluation of trees and other ornamental plants for specific uses in many urban landscape situations is also needed along with additional information relating to the nutrition of and weed control in ornamental plantings.

Research emphasis in the above areas has been increased in recent years. However, further increases are needed if the potentials that exist are to be fully realized. Increasing student numbers in this area of the department tend to restrict faculty energies available for visionary research

HATCH 482: CONTAINER PRODUCTION OF NURSERY STOCK (App. 10/73-76)

Personnel: Fretz, Smith, Sydnor, Buscher (.15 S.M.Y. - .40 T.M.Y.)

Objectives:

1. To study the use of slow release or encapsulated fertilizers in combinations with liquid soluble feeding programs in order to produce high quality container stock.

2. To evaluate promising new pre-emergent herbicide compounds, and combinations or sequential herbicide treatments to control weed growth in container grown nursery stock. In addition the effects of these herbicide treatments on future root development of cuttings taken from treated stock plants will be evaluated.

3. To evaluate the use of polystyrene mulches, various containers, and media as they effect production and winter survival in storage houses with and without heat.

4. To evaluate several new or promising growing medias for use in container nursery production in order to establish a series of basic medias for use in the industry.

This research data encompasses studies to develop and to refine those techniques concerned with the various aspects of container plant production. Studies with over-wintering structures are also included.

HATCH 549: GROWTH REGULATION OF WOODY ORNAMENTALS (App 7/75-78)

Personnel: Sydnor (.50 S.M.Y. - .30 T.M.Y.)

Objectives:

1. Reduce the labor required in landscape maintenance through the use of chemicals exhibiting the potential to reduce the growth rate of various landscape plants.

2. Reduce the labor required to plant production in the nursery through the selection and use of plant growth regulating compounds.

Much of the effort in this area has involved the evaluation of various growth regulating substances and their potential usefulness in improving the plant for specific purposes.

STATE 451: OPTIMUM NUTRITIONAL LEVELS FOR WOODY ORNAMENTAL PLANTS (App. 7/74-79)

Personnel: Smith (.25 S.M.Y. - .80 T.M.Y.)

Objectives:

1. To obtain mineral element data from foliage of woody ornamental plants so as to determine similarities or differences between major genera, species, and cultivars.

2. To ascertain fertilizer application rates and foliar nutrient levels which produce optimum growth of selected woody ornamental plants.

The nutrient levels and requirements of many fruit and vegetable crop plants has received considerable attention in the past but much less in known concerning woody ornamental plants. This research is an attempt to fill this void and to further refine ornamental plant fertilization procedures.

HATCH 475: EVALUATION AND IDENTIFICATION OF WOODY ORNAMENTALS (App 7/73-78)

Personnel: Kawase, Fretz, Sydnor, Crean (.25 S.M.Y. - .30 T.M.Y.)

Objectives:

1. To evaluate the winter hardiness, adaptability and ornamental value of:

   a. Woody materials from the USDA Plant Introduction Station, Ames, Iowa and other appropriate sources.
   b. Woody materials growing in the Secrest Arboretum at Wooster Including Taxus, Juniperus, and Malus.
   c. Roses from All America Rose Selections, Inc., growing at Columbus and from the OARDC Rose Garden at Wooster.

2. To develop the leaf epedermis method for identification of species and cultivars of Rosa, Taxus, and Geditsia triacanthos.

3. To develop chemataxonomic methods to identify cultivars in Juniperus, Taxus, and Rosa.

The evaluation of woody materials for adaptation to Ohio conditions is not a major research effort of the department, but is important if we are to be in a position to supply needed information concerning new and potentially promising plant types. This project has also involved studies in the area of chemotaxonomy. However this work is being transferred to a new project, "Chemical Identification of Woody Ornamental Plants" recently submitted.

NEW F: CHEMICAL IDENTIFICATION OF WOODY ORNAMENTAL PLANTS

Personnel: Fretz (.20 S.M.Y. - .20 T.M.Y.)

Objectives:

1. To evaluate the use of monoterpenes as a toole in the identification of Juniperus horizontalis, Juniperus chinensis and Juniperus virginiana cultivars.

2. To investigate the influence of several environmental and cultural factors on the variation in the monoterpene composition of the genera Juniperus.

3. To evaluate the use of disc-electrophoresis in separating several isozyme systems of selected Rosa cultivars in determining its potential as a tool in clonal identification.

This is a new project, but work in this area has been underway under Objective 3 of Hatch 475. This work is in part supported by a special grant from Horticultural Research Institute.

STATE SPECIAL 148: CHARACTERISTICS AND ADAPTIONS OF SPECIES AND CULTIVARS OF SHADE AND ORNAMENTAL TREES WITH EMPHASIS ON STREET AND HIGHWAY LANDSCAPE USE. (App 5/66-76)

Personnel: Kozel (.25 S.M.Y. - .50 T.M.Y.)

Objectives:

1. To evaluate under similar environmental and cultural conditions relative attributes and faults of selected ornamental and shade tree species and cultivars suited for street, highway and municipal area planting.

2. To determine specific characteristics of these trees such as hardiness, insect and disease resistance, growth rate and growth habit.

3. To devise lists of tree cultivars for specific landscape use.

4. To aid in reducing the time until selected trees "to fit the need" are available for widespread use.

5. To evaluate varieties and cultivars through survey of existing street plantings.

6. To determine the effect of ecological variations on performance of selected cultivars and species.

This study has been a long time effort of the department and was developed in cooperation with and through the support of the Utilities Companies of Ohio. It is yielding highly useful information for shade tree commissions and others concerned with the selection of shade trees for urban environment.

HATCH 330: ROOTING PHYSIOLOGY OF CUTTINGS IN HORTICULTURAL PLANTS
(App 4/75-78)

Personnel: Kawase (.75 S.M.Y - .70 T.M.Y)

Objectives:

1. To explore the use of centrifugal force for cutting production.

2. To investigate the reason why etiolation stimulates rooting of cuttings.

3. To investigate the methods of extraction and identification of the diffusible rooting substance.

4. To investigate the role of ethylene, indole acetic acid, and other rooting substances in the cuttings during rhizogenesis.

The main thrust of a program is designed to enhance our understanding of those factors involved in the rooting of plants and to subsequently provide the basis for improved techniques to enhance plant propagation root development. This program has gained international recognition.

FLORICULTURE

The floriculture industry of Ohio is strong and viable. Ohio currently ranks third in the United States in the production of floral crops under glass and is exceeded only by California and Florida. The industry is expanding rapidly. This trend is expected to continue. Ohio has declined in the production of carnations because of the more favorable growing conditions that exist in California, Colorado and South America. Flowers grown in these areas can be economically shipped by air into Ohio markets. On the other hand, there has been an increase of about 25% in the production of cut chrysanthemums. The large size of the blooms make them more costly to ship by air thus providing an advantage to local producers. The production of roses has doubled in recent years, which has been largely stimulated by the development of the 'Forever Yours' rose which responds favorably to Ohio growing conditions and to local market use.

The production of pot plants in Ohio has increased faster than the expanding population. Presently geraniums represent the number one pot plant in the state and there is seldom an adequate supply of quality pot mums, lilies, and poinsettias for special days. Production of bedding plants has increased dramatically in Ohio and this trend is expected to continue.

A significant contributing factor to the current strength of the floriculture industry in Ohio is the strong and long standing research and extension programs of The Ohio State University and the Ohio Agricultural Research and Development Center. The Florist Short Course, which is held in Columbus annually, attracts well over 1,000 florists, producers, wholesalers and retailers from all over the United States. Currently over 3/4's of the members of this organization are from outside of the state.

The floriculture research emphasis of the department has been developed in an attempt to establish a well balanced total integrated effort. It encompasses 4 areas of overlapping emphasis. Applied research, seeking solutions to immediate industry problems, research to develop concepts and production systems to insure continued growth and refinement of the industry, post-harvest studies to improve the utility and distribution of floral products, and economic studies to improve production efficiencies and marketing systems.

It is recognized that in the future there must be continual emphasis placed on production efficiency, product quality and the conservation of energy. These factors continually underlie the total research thrust. The following is a listing of current research projects designed to satisfy the current and future needs of the industry.

HATCH 503: EFFECTS OF ECOLOGICAL FACTORS, GROWTH REGULATORS, AND CULTURAL TECHNIQUES ON SELECTED FLORAL CROPS (App. 6/74-77)

Personnel: Kiplinger, Poole, Tayama (.45 SMY - .30 TMY)

Objectives:

1. To determine the value of supplementary light to control plant growth and enhance production efficiency of selected floral crops.

2. To determine the effect of both normal day and sub-optimal night temperatures alone or with carbon dioxide enrichment of the atmosphere on production and quality of selected floral crops.

3. To evaluate and develop growing mediums and means of management of such mediums for production of various floral crops.

4. To develop modified cultural practices including sub-irrigation, growth regulators, and pinching techniques upon the efficiency of production and the quality of various floral crops.

There is a continuing need to seek answers to current problems confronting producers as well as the development and refinement of specific practices. This project has been developed to satisfy these needs. Graduate students contribute significantly to this research thrust.

NEW P: INCREASING EFFICIENCIES IN FLORAL CROP PRODUCTION.

Personnel: Poole (.40 S.M.Y. - .50 T.M.Y.)

Objectives:

1. To study the cultural practices that would lend themselves to mechanization or reduced labor requirements and to more efficient utilization of available resources.

2. To study production systems that will more efficiently utilize available production space by use of multiple moves and more intensive utilization of environmental factors.

3. To study production techniques that would increase utilization of horizontal and vertical space in a greenhouse.

This is a new project, recently submitted for approval, and was initiated to develop research of a longer term nature contributing to the development of new and advanced floral crop production techniques. New systems are envisioned with individual studies to be conducted to provide the "building blocks" required to fully develop the projected concepts. Emphasis will be placed on increasing the efficient use of labor and energy.

HATCH 512: POST-HARVEST PHYSIOLOGY OF FLORICULTURAL CROPS (App. 9/75-79)

Personnel: Staby (.75 S.M.Y. - 1.0 T.M.Y.)

Objectives:

1. To develop new preservatives for both cut and potted floricultural crops.

2. To further investigate the physiological roles of ethylene.

3. To investigate the effects of hypobaric storage on cut and potted floricultural crops.

4. To develop once-over-harvest handling and management techniques of bud-cut flowers.

This research area is designed to develop new and advanced concepts relating to the post-harvest handling and distribution of floral crops to not only increase efficiencies in harvesting and handling techniques, but to also improve the quality of the end product available to the ultimate consumer.

NEW R: IMPROVING THE ECONOMIC VIABILITY OF THE MARKETING SYSTEM FOR HORTICULTURAL CROPS.

Personnel: Robertson (.30 S.M.Y. - .00 T.M.Y.)

Objectives:

1. To evaluate the economic feasibility and impact of implementing bud stage harvesting and hypobaric storage technologies in the production and marketing of ornamental commodities.

2. To analyze the comparative advantages of floriculture and nursery firms to determine the structure and organization adjustments necessary for the enhancement of their competitive position in their respective markets.

3. To quantify the supply and demand characteristics for major floricultural and nursery commodities and services including the consumer's response to price, income, and product characteristics and the producers' supply response to important decision variables.

This is a new research area within the department and will interrelate with other ongoing research. Emphasis will be placed on conducting economic studies relating to the potential opportunities that may emerge as a result of the development of new production and handling techniques. The success of this program will be dependent upon the researchers clear understanding of, and close relationship with the various facets of total industry. It is, likewise, anticipated that there will be considerable involvement in various specific aspects of this research by faculty of the Department of Agricultural Economics.

III - RESIDENT INSTRUCTION

It has long been the philosophy of the department to place major emphasis upon instructional programs. The faculty are dedicated to this mission. The department not only has the responsibility of providing the very best horticultural training possible for majors, but also to provide educational opportunities for all students that have the desire to broaden their educational experience through courses in Horticulture. It is also the responsibility of the department to provide "service" courses for other departments and schools where the need for horticultural subject matter may be required.

During the past five years there has been a dramatic increase in the resident instructional programs of the department. The number of student credit hours taught within the department has increased from 5,331 during academic year '70-'71 to 14,430 during academic year '74-'75. The number of students majoring in Horticulture has likewise increased from 133 in '70-'71 to approximately 400 at the present time.

There are many reasons for the current unprecedented growth. The increasing concern over natural beauty and the quality of our environment has provided a stimulus to many students to develop an interest in plants and to seriously consider career opportunities in this area. The increasing interest in natural beauty and the environment and gardening as a leisure time recreational activity has had the effect of increasing job opportunities in the total field. It is anticipated that the increasing concern over food; its availability and quality, will provide further stimulus to enrollment. The most significant increases have occurred in the Landscape-Horticulture area and in Floriculture; however all programs of the department have shared in this growth. To date there continues to be a strong demand for horticulturally trained people; however there is some concern that with the increasing numbers of students graduating in both the Landscape-Horticulture and Floriculture areas there could develop a surplus of trained people in these areas with the less qualified having difficulty in locating jobs in their area of training. It is the general philosophy of the department that we must retain and further enhance the quality of our programs and in this way provide our students the opportunity to effectively compete for jobs.

Within the past year the total course offerings of the department have been carefully reviewed and numerous changes proposed. The principle thrust of the proposed changes is that of adjusting offerings to meet the changing needs of students. The total "package" of course revisions has been submitted to and approved by the College committee on academic affairs.

Every effort has been made to maintain quality of instruction in spite of increasing class sizes and faculty teaching loads. It is significant that student credit hours taught per full time faculty teaching equivalent has increased from 762 to 1458 over the past five years. With the continuing increase in student numbers, additional teaching resources will be necessary if the quality and vitality of the undergraduate resident instruction program is to continue. The following tables summarize recent trends that have occurred in the instructional programs of the department.

TEACHING LOADS AND BUDGET SUPPORT

DEPARTMENT OF HORTICULTURE

1970 - 1975

	70-71	71-72	72-73	73-74	74-75	% Change Past 5 yrs.	% Change Past 2 yrs.
Stu. Cr. Hr							
Hort. -	4036	5282	7283	10,230	12,620	+213	+ 73
Agr 200 -(1)	1295	1555	1780	1,740	1,810	+ 40	+ 2
Total	5331	6837	9063	11,970	14,430	+171	+ 59
Hort. Majors (Autumn Quarter)	133	129	172	238	331	+149	+ 92
Tot. OSU Bud.(2) Allocations	241,444	252,881	274,618	309,112	358,433	+ 48	+ 30
Cost per S.C.H.	$45.29	$36.99	$30.30	$25.82	$24.84	- 45	- 18
F.T.E. *Teaching Faculty*	7.00	7.15	7.40	8.90	9.90	+ 41	+ 34
S.C.H. Taught per F.T.E. faculty	762.	956.	1225.	1345.	1458.	+ 91	+ 19

(1) Includes only those sections taught by Horticulture faculty.

(2) Some additional monies were provided from time to time for extra labor and do not appear in these figures.

STUDENT CREDIT HOURS TAUGHT BY COURSES*

Course	70-71	71-72	72-73	73-74	74-75	% Change Past 5 yrs	% Change Past 2 yrs
111 Intro. Landscape Hort.	369	672	1626	2250	2367	+ 541	+ 46
112 Princ. Landscape Hort.	---	---	----	182	236	---	--
170 Wine in Western Culture	---	---	----	323	852	---	--
202 Fruits - Veg. for Man	---	---	----	102	138	---	--
203 Hort. Morphology	162	219	216	300	360	+ 122	+ 96
231 Landscape Plants I	---	---	----	351	627	---	--
232 Landscape Maintenance	---	---	----	360	339	---	--
233 Landscape Plants II	---	---	132	285	285	---	+116
241 Food Preservation	75	84	84	129	123	+ 64	+ 46
299 Plants & Man (Honors)	120	120	130	145	100	- 16	- 23
431 Herbesceous Plants	145	125	350	330	625	+ 331	+ 78
432 Woody Deciduous Plants	245	235	170	460	470	+ 92	+176
433 Woody Evergreen Plants	190	---	230	400	390	+ 105	+ 70
434 Woody Plants	135	180	145	345	315	+ 144	+117
441 Processing Fr. & Veg.	135	125	180	120	150	+ 11	- 16
442 Quality Att. Fr. & Veg.	85	85	95	110	125	+ 47	+ 32
450 Veg. Crop Prod.	65	110	180	85	175	+ 169	- 5
461 Tree Fruit Crop Prod.	20	50	75	75	140	+ 600	+ 87
462 Small Fr. Prod.	20	60	120	80	135	+ 575	+ 13
515 Plant Propagation	150	170	280	320	555	+ 270	+ 98
601 Hort. Plant Breeding	---	36	33	33	54	---	+ 64
609 Post-Harvest Physiology	35	30	50	80	135	+ 286	+170
610 Weed Control	24	30	78	90	105	+ 333	+ 34
621 Greenhouse Env. Control	130	140	185	195	375	+ 188	+103
622 Flor.-Potted Plants	65	55	55	100	160	+ 146	+191
624 Flor.-Marketing	55	50	60	55	115	+ 109	+ 92
631 Arboriculture	95	115	205	115	255	+ 168	+ 24
633 Nursery Management	80	95	165	110	150	+ 87	- 11
641 Unit Oper. Proc. I	55	75	100	85	110	+ 100	+ 10
642 Unit Oper. Proc. II	45	65	65	75	45	---	- 31
643 Unit Oper. Proc. III	45	70	60	60	85	+ 89	+ 42
652 Adv. Veg. Crops	---	---	30	75	75	---	+150
741 Food Regulations	140	115	110	165	175	+ 25	+ 59

* List does not include some of the more recently introduced courses.

STUDENT CREDIT HOURS TAUGHT BY GENERAL AREAS

Course Areas	70-71	71-72	72-73	73-74	74-75	% Change 5 yr.	% Change 2 yr.
General & Service - (Non Majors) 111, 112, 202, 203, 231, 232, 233, 299	651	1011	2104	3975	4941	+659	+134
General - (Hort Majors) 511, 515, 601, 602, 609, 610, 611, 612, 734	319	381	601	603	1045	+227	+ 74
Landscape Hort. 432, 433, 434, 631, 633	745	625	915	1430	1580	+112	+ 72
Floriculture 431, 621, 622, 623, 624	455	420	705	760	1395	+211	+ 88
Fr. & Veg. Proc. 241, 441, 442, 641, 642, 643, 645, 646, 647, 648, 741, 742, 743, 794	580	619	694	744	945	+ 62	+ 36
Fruit Production 461, 462	40	110	195	155	275	+588	+ 41
Veg. Production 450, 650, 652	80	110	210	215	270	+238	+ 29
Enology & Viticulture 170, 670	--	--	--	323	877	--	--

IV GRADUATE PROGRAMS

Within recent years, increasing emphasis has been placed upon the strengthening of the graduate programs of the department. Graduate study enrollment has increased from about 35 to 52 over the past five years. Through the efforts of the departmental Graduate Committee, a Graduate Study Handbook and a Graduate Faculty Handbook have been developed. These documents were prepared to establish and clarify departmental procedures, policies, and guidelines.

The Graduate Seminar of the department has developed into a strong and integral segment of the total graduate programs of the department. Emphasis is placed upon student presentations of research. All graduate students are required to attend all seminars. The quality of presentations has noticeably improved of late which is projected to ultimately result in improved quality of future research presentations at professional meetings.

While specific figures are not readily available, there has been a significant increase in the number of applicants for graduate study in the department. More significant, however, is the fact that within the past year there has been an improvement in the qualifications of applicants as reflected by GRE scores, and undergraduate grade point averages. It is also significant that the proportion of women making application has increased.

There is presently considerable debate among the graduate faculty concerning the goals and aspirations of graduate students and what, if any changes, should be made in our total graduate study philosophy in light of these changing needs. For example: while the greater majority of graduate students do have primary interest in research related careers, more and more students are expressing principal interest in university and technical school teaching positions. A greater number of students are indicating interest in extension positions, both at the specialist and at county levels, and in entering into horticultural industry research related positions.

Of the present 52 graduate students enrolled in the department, 19 are in Ph.D. programs, 30 in Master of Science programs, and 3 are in combined B.S.-M.S. programs. Ten of the 52 graduate students are female. Approximately two-thirds of the graduate students of the department are U.S. students and 17 are from the 11 following foreign countries: Greece, Pakistan, Phillipines, Lebanon, Libya, Taiwan, India, Turkey, China, Egypt, and Sudan.

DISTRIBUTION OF GRADUATE STUDENTS BY DEPARTMENTAL AREAS OF EMPHASIS

Food Technology	22
Vegetable Crops	12
Landscape Horticulture	9
Floriculture	6
Pomology	3

SOURCES OF GRADUATE STUDENT SUPPORT

Sources of Support	Number of Students
Self	23
Horticultural Industry Sources	8
Foreign Government Sources	7
OARDC - Casuals	6
Specific Grants	4
OSU - Specials	2
Fellowship (Helena Chamberlain)	1
TVA	1

It is recognized that a strong viable graduate program provides significant strength to the total research effort of a department and such programs are greatly influenced by the dedication of the faculty to excellence as well as the strength and quality of students attracted to the programs. The graduate faculty of the department are committed to the further strengthening of graduate study programs and increasing emphasis is being placed upon recruiting "the outstanding student". It is recognized, however, that it is not likely that continued growth of the graduate study programs will occur without the availability of additional graduate study support monies.

V COOPERATIVE EXTENSION

An integral part of the total functions of the department are the extension programs. Currently there are 8.05 F.T.E. extension specialist faculty assigned to the department. In addition to this there are two area extension horticulture positions. The horticultural industries of the state are fortunate to have the depth of experience that currently exists within the extension faculty. All state speciliasts' positions are currently filled, however, one of the two area horticulture positions is vacant, that being the vice-White position located in northwest Ohio and concerned primarily with processing vegetable crops.

Due to the growth that is taking place within the horticultural industries of Ohio and the general increased interest in plants, it is becoming increasingly difficult to serve the expanding educational needs and to capitalize on the new opportunities that exist with the limited faculty involved. In an attempt to extend resources there have been adjustments in program execution. Greater emphasis is being placed upon state-wide and area-wide commodity meetings, through, in some instances, the combining of smaller localized meetings. Wider use is also being made of publications, particularly newsletters, to disseminate information. Recent major reductions in travel and publications budgets is having adverse effects upon the effectiveness of departmental programs.

It is recognized that in these times it is essential that new technologies be rapidly disseminated and quickly adopted if the full impact of these developments are to be realized. Wherever possible an effort is made to get new applied research information into the hands of producers in sufficient time to provide them the opportunity to capitalize on these findings the growing season following the generation of the research data. If this is to be accomplished, a close interrelationship between research and extension is essential, with extension faculty becoming involved in the applied aspects of ongoing research programs.

Every effort is made to assign extension faculty time in such a way as to most effectively serve the varied horticultural interests of the state. The following is a summary of extension faculty time distribution:

HORTICULTURAL EXTENSION SPECIALISTS' TIME DISTRIBUTION

Program Area	F.T.E. Time Assignment
Floriculture (commercial)	1.35
Nursery Crops (commercial)	.75
Fruit Crops (commercial)	1.55
Vegetable Crops (commercial)	2.40
Ornamental Horticulture (non-commercial)	.75
Home Fruit and Vegetable Production	.50
Youth Programs	.50
Administration	.25

In addition to the above, one of the area horticulturists works predominately with the commercial nursery industries of north central Ohio whereas the other area position, currently vacant, is assigned to work with the horticultural interests of northwest Ohio with emphasis on processing vegetable crops.

There are not extension specialists specifically assigned to work with the processing segment of the fruit and vegetable industries of Ohio. Specific processors are highly specialized and can best be served by those faculty intimately involved in the specific technologies relating to that particular phase of processing. As a consequence, research faculty are encouraged to assist individual processors as the need may arise in their particular areas of emphasis. The major activities to date relate to work with tomato processors, wineries, and pickle packers.

Support staff for the extension programs of the department consists of 4.2 clerical staff and 1.0 technicians. The latter involved predominately with the development of the Home Horticulture Center.

A key element of the extension programs of the department involves publications. Because of the expanding interest in Horticulture in general and the specific technologies related to the varied industries, increasing use of publications is furthering the contributions of the department. During FY 74-75, $34,000 were expended on extension publications relating to horticultural topics. A series of one-page fact sheets, identified as Landscape Facts, have been prepared and are widely distributed. There are currently over a 140 specific Landscape Facts sheets covering a wide range of topics relating to the home grounds. Presently over one million individual sheets are disseminated annually. Extensive use is also made of various newsletters designed for rapid dissemination of information to specific specialized commodity groups. Recent budget restrictions have forced a reduction in the publications and disseminations of horticultural information.

In an attempt to provide increasing support to county offices with respect to the demands for general home horticultural information, a Home Horticulture Center was established within the department. The principal thrust of the Center is to provide agents with suggestions and information on how to better satisfy the homeowner demands for horticultural information. Through the Center several slide series are being developed for use throughout the state. The Center is also responsible for responding to telephone and letter requests for "home horticultural" information.

It is significant that 12 members of the departmental faculty share the 8.05 F.T.E. extension faculty positions with several holding split appointments between extension and research. In other instances, full time extension faculty are becoming intimately involved in some of the applied aspects of the research effort. Such arrangements facilitate the rapid dissemination and adoption of new research findings. A number of the faculty of the department, not holding formal extension appointments, devote up to 10% of their time to the total extension effort. A close relationship between extension, research, and teaching responsibilities of the department is considered to be important to the effective discharge of departmental responsibilities.

An attempt is being made to increase the involvement of graduate students in ongoing extension programs. This effort is to primarily broaden the scope and mission of the student, but also results in considerable contributions to the

extension effort. Greater graduate student involvement in extension programs is anticipated in the future.

It is becoming increasingly important that extension faculty be provided the opportunity and encouragement to travel to other regions of the country in order that they might be better informed, particularly in the areas not covered by ongoing research in Ohio. A number of group meetings involving extension faculty from three or four adjoining states have recently been undertaken to coordinate recommendations and to integrate efforts.

Faculty of the Department of Horticulture, The Ohio State University and the Ohio Agricultural Research and Development Center, Sept. 3, 1975. FIRST ROW: W. M. Brooks, W. L. Bauerle, J. D. Utzinger, R. G. Hill, Jr., H. A. Rollins, Jr., E. C. Wittmeyer, R. C. Blake, E. K. Alban. SECOND ROW: J. L. Caldwell, R. R. Smith, D. C. Kiplinger, A. C. Peng, D. W. Kretchman, W. A. George, Jr., F. K. Buscher, S. Z. Berry, H. A. Poole, H. K. Tayama, THIRD ROW: J. L. Robertson, J. R. Geisman, E. M. Smith, T. D. Sydnor, E. J. Stang, G. L. Staby, A. R. Mosley. MISSING: G. A. Cahoon, D. C. Crean, D. C. Ferree, T. A. Fretz, J. F. Gallander, W. A. Gould, F. O. Hartman, M. Kawase, P. C. Kozel.

EVAN KENNETH ALBAN

ACADEMIC RANK: Professor

TRAINING: B.A. - Denison University - 1936

M.S. - The Ohio State University - 1943

Ph.D. - The Ohio State University - 1945

AREA OF SPECIALIZATION: Vegetable crop physiology and herbicide studies with horticultural crops and soils.

DIVISION OF TIME: OARDC 18% OSU 82% CES --

PROFESSIONAL EXPERIENCE:

1945-1946 - Instructor Botany and Microbiology - Denision University
1945-1946 - Instructor Horticulture - The Ohio State University
1946-1949 - Assistant Proessor of Horticulture - OSU & OARDC
1949-1960 - Associate Professor of Horticulture - OSU & OARDC
1960- - Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science
American Society of Plant Physiologists
American Association for Advancement of Science
Weed Science Society of America (Fellow)*
American Institute for Biological Science
North Central Weed Control Conference*
Ohio Academy of Science (Fellow)

MAJOR CURRENT RESPONSIBILITIES:

Teaches Agron 200 - Plant Science in Agriculture; Hort 450 - Principles of Vegetable Crop Production; Hort 610 - Weed Control in Horticultural Crops; Hort 611 - Tropical and Subtropical Fruit and Vegetable Production; Hort 650 - Greenhouse Vegetable Crops. Conducts research with chemical weed control in vegetable crops and the evaluation of vegetable cultivars. Advises three graduate students. Serve as Scheduling Coordinator for the Department and makes numerous Extension presentations in the weed control area.

WILLIAM L. BAUERLE

ACADEMIC RANK: Assistant Professor

TRAINING: B.S. - Delaware Valley College - 1964

M.S. - Rutgers, The State University - 1966

Ph.D. - Cornell University - 1970

AREA OF SPECIALIZATION: Greenhouse Vegetable Crops
Vegetable Crops

DIVISION OF TIME: OARDC 100% OSU -- CES --

PROFESSIONAL EXPERIENCE:

1970- - Assistant Professor of Horticulture, OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science*
International Society for Horticultural Science
North American Greenhouse Vegetable Conference*
MidWest Greenhouse Vegetable Conference*

MAJOR CURRENT RESPONSIBILITIES:

Conducts research relating to cultural techniques with greenhouse tomatoes and other greenhouse vegetable crops. Co-Advisor to one graduate student. Chairman Departmental (Wooster) Greenhouse Committee. Chairman of O.A.R.D.C. Greenhouse Vegetable Day Committee.

STANLEY Z. BERRY

ACADEMIC RANK: Associate Professor

TRAINING: B.S. - Cornell University - 1952

M.S. - University of New Hampshire - 1953

Ph.D. - University of California - 1957

AREA OF SPECIALIZATION: Processing tomato breeding and variety evaluation; Research on pertinent breeding factors - physiologic and pathologic

DIVISION OF TIME: OARDC 100% OSU -- CES --

PROFESSIONAL EXPERIENCE:

1957-60 - Research Scientist - Beltsville, Md. - USDA, ARS
1960-67 - Plant Breeder - Campbell Soup Co., Davis, Calif. and Riverton N.J.
1967 - - Associate Professor of Horticulture - OARDC and OSU

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science*
American Phytopathological Society
Sigma Xi
Tomato Genetics Cooperative
Tomato Breeders Round Table*

MAJOR CURRENT RESPONSIBILITIES:

Conducts breeding studies designed to develop superior processing tomato cultivars. Program Chairman for the Tomato Breeders Round Table. Chairman of O.A.R.D.C. Processing Tomato Day.

ROLAND C. BLAKE

ACADEMIC RANK: Adjunct Associate Professor

TRAINING: B.S. - University of Maine - 1949

Ph.D. - University of Minnesota - 1954

AREA OF SPECIALIZATION: Horticultural Plant Breeding, Small Fruit Breeding, Breeding pears of high quality and fire blight resistance. Genetics

DIVISION OF TIME: OARDC 100% (USDA)

PROFESSIONAL EXPERIENCE:

1954-1957 - Assistant Professor, Northwestern Washington Experiment Station Washington State College, Mount Vernon, Washington
1957-1959 - Research Horticulturist, USDA, ARS, Southern Oregon Branch Experiment Station, Medford, Oregon.
1959-1973 - Research Horticulturist, USDA, ARS, Southern Illinois University, Carbondale, Illinois.
1973- - Research Horticulturist, USDA, ARS, OARDC, Wooster, Ohio.

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science
American Pomological Society
Pear Breeders Conference*

Further Graduate or Post-Doctorate Study

Beginning Computer Science - 1969
Advanced Computer Programming - 1970
USDA Course in Supervisor Training - 1975

MAJOR CURRENT RESPONSIBILITIES:

Serves as the leader for the cooperative USDA-OARDC pear breeding program designed to develop pear cultivars which have resistance to fire blight and possess high quality fruit characteristics. Local USDA representative on the cooperative USDA - OARDC cooperative project designed to develop hardy thornless blackberry cultivars.

WILLIAM M. BROOKS

ACADEMIC RANK: Associate Professor

TRAINING: B.S. - Ohio University - 1954

M.S. - The Ohio State University - 1957

AREA OF SPECIALIZATION: Vegetable crop physiology with emphasis on vegetables grown in greenhouses and outdoor vegetables grown for fresh market.

DIVISION OF TIME: OARDC -- OSU -- CES 100%

PROFESSIONAL EXPERIENCE:

1953-1956 - Research Assistant - OARDC
1956-1958 - Instructor - West Virginia University & Agricultural Experiment Station
1958-1967 - Assistant Professor & Extension Horticulturist - OSU
1967- - Associate Professor and Extension Horticulturist - OSU

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science*
American Institute of Biological Sciences
National Agricultural Plastics Association*

MAJOR CURRENT RESPONSIBILITIES:

Develop and execute Extension educational programs in the areas of greenhouse vegetable production and fresh market outdoor vegetable production. Assists with research in the fresh market vegetable cultivar evluation studies. Serves as Assistant Chairman to the Departmental Farm Science Review Committee.

FRED K. BUSCHER

ACADEMIC RANK: Associate Professor

TRAINING: B.S. - The Ohio State University - 1950

M.S. - The Ohio State University - 1965

AREA OF SPECIALIZATION: Commercial landscape horticulture with emphasis in turfgrass management, nursery stock production, landscape design and maintenance, garden store management

DIVISION OF TIME: OARDC -- OSU -- CES 100%

PROFESSIONAL EXPERIENCE:

1956-1957 - Associate County Agent, Cuyahoga County, Ohio
1957-1962 - County Extension Agent, Cuyahoga County, Ohio
1962-1968 - Area Extension Agent, Horticulture, Lorain, Cuyahoga, Lake and Ashtabula Counties
1968 - - Area Extension Agent, Horticulture, Wooster-Canfield Areas

PROFESSIONAL IMPROVEMENT:

Society Membership

American Society for Horticultural Science
International Plant Propagators Society
American Society of Landscape Architects

Sabbatical Leave

1960 - One Quarter, The Ohio State University
1964-1965 - The Ohio State University
1975 - One Quarter, The Ohio State University
1975 - OCEAA Interstate Study Trip
1971-1972 - O.M. Scotts Turfgrass Study Trip

MAJOR CURRENT RESPONSIBILITIES:

Develops and executes extension educational programs relating to Landscape Horticulture for the Commercial Nursery industry of the Wooster and Canfield areas. Development of extension educational programs on landscape design. Annual Area Horticultural Trade Meeting - a mini-Short Course.

GARTH A. CAHOON

ACADEMIC RANK: Professor

TRAINING: B.S. - Utah State University - 1950

Ph.D. - Univ. of Calif., Los Angeles - 1954

AREA OF SPECIALIZATION: Plant nutrition, tree fruit and grape physiology

DIVISION OF TIME: OARDC 60% OSU -- CES 40%

PROFESSIONAL EXPERIENCE:

1954-55 - Jr. Horticulturist - Univ. of Calif., Riverside, Calif.
1955-63 - Assist. Horticulturist - Univ. of Calif., Riverside, Calif.
1963-67 - Associate Professor of Horticulture - OARDC
1967- - Professor of Horticulture - OARDC & OCES

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attend*)

American Society for Horticultural Science*
International Society for Horticultural Science
Council on Soil Testing and Plant Analysis*
Ohio State Horticultural Society*

Further Graduate or Post-Doctorate Study

Consultant - Foliar Analysis-India-1968-1970

MAJOR CURRENT RESPONSIBILITIES:

Conducts research relating to grape cultivar selection and cultural practices, and on mineral nutrition of fruit crops. Develops and executes extension educational programs relating to grapes and mineral nutrition of fruit crops. Advises graduate student. Co-Chairman Ohio Grape-Wine Short Course. Chairman Mineral Nutrition Committee American Society for Horticultural Science. Serves on College Committee for International Affairs. Member department Graduate Committee.

JAMES L. CALDWELL

ACADEMIC RANK: Professor

TRAINING: B.S. - The Ohio State University - 1952

M.S. - The Ohio State University - 1953

AREA OF SPECIALIZATION: Landscape Horticulture

DIVISION OF TIME: OARDC -- OSU -- CES 100%

PROFESSIONAL EXPERIENCE:

1953-1956 - Superintendent, Floriculture Greenhouse and Gardens - OSU
1956-1962 - Assistant Professor of Horticulture - OSU
1962-1971 - Associate Professor of Horticulture - OSU
1971- - Professor of Horticulture - OSU

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Horticultural Society

MAJOR CURRENT RESPONSIBILITIES:

Work with the home gardner to make his environment a better place in which to live including the proper selection, care and maintenance of landscape plants. The program involves working with county extension agents in Agriculture, Home Economics, and 4 H throughout Ohio, as well as other adult groups seeking further information and assistance with their garden projects. Serves as Chairperson of the College of Agriculture Awards Committee for Environmental Improvement. Serves on the Housing Task Force for the College of Agriculture. Serves on the Coordinating Committee for the department Home Horticulture Center.

DAVID E. CREAN

ACADEMIC RANK: Associate Professor

TRAINING: B.A. (Hons.) - University of Cambridge - 1960

M.A. - University of Cambridge - 1966

Ph.D. - The Ohio State University - 1969

AREA OF SPECIALIZATION: Chemical composition of horticultural crops with special reference to carbohydrates, phenolic compounds and vitamins and the changes induced in them by processing.

DIVISION OF TIME: OARDC 50% OSU 50% CES --

PROFESSIONAL EXPERIENCE:

1960-1964 - Research Assistant, The Fruit and Vegetable Preservation Research Association, Chipping Campden, England
1964-1966 - Scientific Officer, The Fruit and Vegetable Preservation Research Association, Chipping Campden, England
1967-1969 - Research Associate, OARDC
1969-1975 - Assistant Professor of Horticulture - OSU & OARDC
1975- - Associate Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

Institute of Food Technologists (Professional Member)*
American Chemical Society (including membership in Division of Agricultural and Food Chemistry)
American Society for Horticultural Science
American Association for the Advancement of Science

MAJOR CURRENT RESPONSIBILITIES:

Teaches Hort 170 - Wine in Western Culture; Hort 511 - Analysis of Horticultural Plant Materials; Hort 602 - Pigments and Coloration of Plants; Hort 642 - Unit Operations in Processing Fruits, Vegetables, and Related Products II. Conducts research relating to the effect of cultivar post-harvest and processing variables on nutrient content of selected vegetables. Advises two graduate students. Serves as a member of National Task Force on Nutrient Labeling of Fresh Fruits and Vegetables. Chairman of Departmental Seminar Committee. Faculty Advisor to International Students Association.

DAVID C. FERREE

ACADEMIC RANK: Assistant Professor

TRAINING: B.S. - The Pennsylvania State University - 1965

M.S. - University of Maryland - 1968

Ph.D. - University of Maryland - 1969

AREA OF SPECIALIZATION: Tree fruit physiology with emphasis on management of high density orchards.

DIVISION OF TIME: OARDC 100% OSU -- CES --

PROFESSIONAL EXPERIENCE:

1971- - Assistant Professor of Horticulture - OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attend*)

American Pomological Society
American Society for Horticultural Science*
Dwarf Fruit Tree Association*

MAJOR CURRENT RESPONSIBILITIES:

Conducts research on apple rootstocks, development and evaluation of high density apple production systems, and on influence of pesticides, leaf injury and mites on net photosynthesis of apple leaves. Co-advisor to two graduate students. Serves on International Dwarf Fruit Tree Association Advisory Committee for studies with apple rootstocks and high density plantings. Chairman of OARDC Orchard Day Committee. Member OARDC Library Committee.

THOMAS A. FRETZ

ACADEMIC RANK: Assistant Professor

TRAINING: B.S. - University of Maryland - 1964

M.S. - University of Delaware - 1966

Ph.D. - University of Delaware - 1960

AREA OF SPECIALIZATION: Landscape Horticulture, container plant production, weed control, and the chemical identification of ornamental plant cultivars.

DIVISION OF TIME: OARDC 40% OSU 60% CES --

PROFESSIONAL EXPERIENCE:

1969-1972 - Assistant Professor - University of Georgia, Experiment, Georgia
1972- - Assistant Professor of Horticulture - OARDC & OSU

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science*
American Horticultural Society
International Plant Propagators Society*
Sigma Xi
Phi Alpha Xi

MAJOR CURRENT RESPONSIBILITIES:

Teaches Hort 515 - Plant Propagation; Hort 734 - Physiology of Ornamental Plants; Hort 811 - Advanced Plant Nutrition I - Macro-nutrients; Hort 812 - Advanced Plant Nutrition II - Micro-nutrients. Advises five graduate students. Conducts research concerning the chemical identification of ornamental plant cultivars, chemical weed control and container nursery crop production. Serves on Graduate Research and Education Committee of the College. Chairman of the Faculty Affairs Committee of the College. Serves on the Undergraduate Committee of the department.

JAMES F. GALLANDER

ACADEMIC RANK: Professor

TRAINING: B.S. - The Ohio State University - 1960

Ph.D. - The Ohio State University - 1964

AREA OF SPECIALIZATION: Fruit processing with emphasis on determining the effect of variety, cultural practices and processing treatments on the quality of fruit products

DIVISION OF TIME: OARDC 100% OSU -- CES --

PROFESSIONAL EXPERIENCE:

1963-1964 - Instructor - OARDC
1964-1968 - Assistant Professor of Horticulture - OARDC
1968-1972 - Associate Professor of Horticulture - OARDC
1972- - Professor of Horticulture - OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

Institute of Food Technologists*
American Society of Enologists*
Lake Erie Section - Institute of Food Technologists
Eastern Section - American Society of Enologists

Further Graduate & Post-Doctorate Studies

Sabbatical Leave - University of California, Davis, 1969-1970

MAJOR CURRENT RESPONSIBILITIES:

Conducts research in the area of food processing technology with fruit crops with special emphasis on enology and the suitability of cultivars for processing. Teaches Hort 670 - Enology I - Principles and Wine Technology. Advises one graduate student. Chairman of Departmental Safety Committee (Wooster). Co-Chairman Ohio Grape-Wine Short Course. Member Board of Directors Eastern Section American Society for Enologists.

JEAN R. GEISMAN

ACADEMIC RANK: Professor

TRAINING: B.S. - The Ohio State University - 1955

M.S. - The Ohio State University - 1956

Ph.D. - The Ohio State University - 1958

AREA OF SPECIALIZATION: Fruit and vegetable processing with emphasis on sanitation, waste disposal, fermentation and radiation.

DIVISION OF TIME: OARDC 50% OSU 50% CES --

PROFESSIONAL EXPERIENCE:

1956-1958 - Research Assistant - OARDC
1958-1963 - Assistant Professor of Horticulture - OSU & OARDC
1963-1967 - Associate Professor of Horticulture - OSU & OARDC
1967- - Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

Institute of Food Technologists*
Ohio Valley Section - Institute of Food Technologists
Phi Tau Sigma, National Honorary for Food Sciences
National Symposiums on Food Processing Wastes*

MAJOR CURRENT RESPONSIBILITIES:

Teach Agron 200 - Plant Science in Agriculture; Hort 299 - Plants and Man; Hort 645 - Fermented Vegetable Product Technology; Hort 649 - Packaging Materials and Methodology; Agr 590 - Honors Colloquim. Conducts research in the development of spent pickling brine recycling methods and the utilization of tomato and cabbage wastes. Advises five graduate students. Serves as Chairman of the College Honors Committee. Serves on the College Research and Graduate Education Committee. Serves on the OARDC Radioisotope Committee, Serves on the University Radiation Safety Committee. Serves on the University Graduate Council. Serves as a National Reviewer of E.P.A. Brine Recycling Research.

WILLIAM L. GEORGE, JR.

ACADEMIC RANK: Associate Professor

TRAINING: B.S. - Delaware Valley College of Science and Agriculture - 1960

M.S. - Rutgers-The State University - 1962

Ph.D. - Rutgers-The State University - 1966

AREA OF SPECIALIZATION: Genetics and breeding of greenhouse vegetable crops, development of new breeding systems in vegetable crops, developmental genetics of sex expressions in plants.

DIVISION OF TIME: OARDC 60% OSU 40% CES --

PROFESSIONAL EXPERIENCE:

1963-1966 - Research Assistant-Assistant Instructor - Rutgers University
1966-1971 - Assistant Geneticist - Connecticut Agricultural Experiment Station, New Haven, Conn.
1971- - Associate Professor of Horticulture - OARDC & OSU

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Genetic Association
American Society for Horticultural Science*
Botanical Society of America
Genetics Society of America
Sigma Xi

MAJOR CURRENT RESPONSIBILITIES:

Conducts research relating to the development of new greenhouse tomato cultivars and assists with vegetable cultivar evaluation studies. Teaches Hort 202 - Fruits and Vegetables for Man and Hort 601 - Horticultural Plant Breeding. Serves as Chairman of the Departmental Graduate Committee. Advises four graduate students. Supervises greenhouse vegetable operations in Howlett Hall Greenhouses. Serves on the College Committee on Graduate Research and Education.

WILBUR A. GOULD

ACADEMIC RANK: Professor

TRAINING: B.S. - University of New Hampshire - 1942

M.S. - The Ohio State University - 1947

Ph.D. - The Ohio State University - 1949

AREA OF SPECIALIZATION: Food processing and technology with emphasis on vegetables, Food Laws and Regulations, quality control or evaluation, and unit operations in food processing.

DIVISION OF TIME: OARDC 50% OSU 50% CES --

PROFESSIONAL EXPERIENCE:

1941-Summer - Plant Breeder - Ferry Morse Seed Co.
1942-1944 - U.S.D.A. Processed Foods Inspector
1945-1946 - U.S. Navy Fresh and Processed Food Inspector
1947-1948 - Instructor - OSU & OARDC
1948-1953 - Assistant Professor of Horticulture - OSU & OARDC
1953-1957 - Associate Professor of Horticulture - OSU & OARDC
1958- - Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attend*)

Institute of Food Technologists, National & Ohio Valley*
American Society for Quality Control
American Society for Association Executives
Ohio Canners and Food Processors Association*
Council of Canning Association Executives*
Phi Tau Sigma
American Society for Horticultural Science
National Canners Association & National Exposition for Food Processors*

Further Graduate or Post-Doctorate Study

5 weeks - Germany-Italy Food Exposition and Conference - 1959

MAJOR CURRENT RESPONSIBILITIES:

Teaches Hort 241 - Food Preservation; Hort 441 - Processing Fruit and Vegetable Products; Hort 442 - Quality Attributes; Hort 641 - Unit Operation and Processing; Hort 646 - Beverage and Fruit Drink Processing; Hort 741 - Food Regulations; Hort 742 - R and T Technologies: Hort 794a - Food Plant Sanitation; Hort 794 - Advanced Quality Control. Conducts research in relation to potato, tomato and fish processing and in flame sterilization. Advises 11 graduate students. Conducts thermal process schools for industry personnel. Serves as advisor to Food Technology Club and Alpha Gamma Rho Fraternity and as trustee of Fraternity Managers' Association and Food Processors Institute. Serves as consultant to Potato Chip Institute. Serves on Farm Science Review Youth and Food Committee

FRED O. HARTMAN

ACADEMIC RANK: Professor

TRAINING: B.S. - University of Toledo - 1937

M.S. - The Ohio State University - 1941

Ph.D. - The Ohio State University - 1951

AREA OF SPECIALIZATION: Pomology - High-density plantings of stone fruits, fruit setting, fruit thinning, rootstocks, anatomy and morphology

DIVISION OF TIME: OARDC 15% OSU 85% CES --

PROFESSIONAL EXPERIENCE:

1946-1947 - Graduate Assistant - OSU
1947-1948 - Assistant - OSU & OARDC
1948-1951 - Instructor - OSU & OARDC
1951-1953 - Assistant Professor of Horticulture - OSU & OARDC
1953-1962 - Associate Professor of Horticulture - OSU & OARDC
1962- - Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regulary Attends*)

American Society for Horticultural Science*
American Society for Horticultural Science - Tropical Region
International Society for Horticultural Science
Dwarf Fruit Tree Association*
American Pomological Society
Ohio State Horticultural Society*

Further Graduate or Post-Doctorate Study

Winter Quarter - 1968- Traveling and studying tropical, subtropical and temperate fruit production in Mexico. Also trips to Nicaragua - 1971; Costa Rica - 1973; Guatemala - 1975 and Hawaii - 1975 for ASHS meetings and to study fruit production.

MAJOR CURRENT RESPONSIBILITIES:

Teaches Agron 200 - Plant Science in Agriculture; Hort 203 - Horticultural Morphology; Hort 461 - Principles of Tree Fruit Production; Hort 642 - Small Fruit Production; Hort 611 - Toprical and Subtropical Fruit and Vegetable Production; Hort 801a - Morphological and Anatomical Studies of Flowering and Fruiting; 801b - Morphological and Anatomical Studies of Vegetative Plant Parts as Influenced by Environment. Advisor to two graduate students. Conducts research relating to management practices for intensified plantings of stone fruits. Serves as Department Coordination Advisor. Supervises the Lane Avenue Farm Orchards, and serves as advisor to the University Fruit and Vegetable Society.

ROBERT G. HILL, JR.

ACADEMIC RANK: Professor

TRAINING: B.S. - University of Maryland - 1945

M.S. - University of Maryland - 1948

Ph.D. - University of Maryland - 1950

AREA OF SPECIALIZATION: Stone and Small Fruit Culture

DIVISION OF TIME: OARDC 75% OSU 10% CES 15%

PROFESSIONAL EXPERIENCE:

1950-1957 - Assistant Professor Horticulture - OARDC-OSU
1957-1960 - Associate Professor Horticulture - OARDC-OSU
1960-1970 - Professor Horticulture - OARDC-OSU
1970- - Professor & Associate Chairman Horticulture - OARDC-OSU

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attend*)

American Horticultural Society
American Society for Horticultural Science (Fellow)*
American Society of Plant Physiologists
Dwarf Fruit Tree Association
International Society for Horticultural Science
Ohio State Horticultural Society*
Weed Science Society of America*
Sigma Xi

Sabbatical Leave

1963-1964 - Scottish Horticultural Research Institute

MAJOR CURRENT RESPONSIBILITIES:

Coordination of departmental research, teaching and extension programs with particular emphasis upon departmental activities at Wooster. Conducts research relating to chemical weed control in fruit crops and the evaluation of stone and small fruit cultivars. Serves on Joint Publications Committee.

MAKOTO KAWASE

ACADEMIC RANK: Professor

TRAINING: B.A. - University of Tokyo - 1951

M.A. - University of Tokyo - 1954

M.S. - University of Minnesota - 1958

Ph.D. - Cornell University - 1960

AREA OF SPECIALIZATION: Tree physiology with emphasis on: 1) Dormancy of trees, tubers, and seeds; 2) Physiology of root initiation in cuttings; 3) Enthylene and auxin metabolism in horticultural plants; 4) Photoperiodic control of tree growth; and 5) Physiology of water-logged plants.

DIVISION OF TIME: OARDC 100% OSU -- CES --

PROFESSIONAL EXPERIENCE:

1954-1956 - Lecturer - University of Tokyo
1962-1966 - Research Officer-Canada Department of Agriculture
1966-1970 - Associate Professor of Horticulture - OARDC & OSU
1970- - Professor of Horticulture - OARDC & OSU

PROFESSIONAL IMPROVEMENT:

Society Memberships (Regularly Attends*)

American Association of Advanced Science
American Society for Horticultural Science*
American Society of Plant Physiology
International Society of Horticultural Science*
International Plant Propagator's Society*
International Shade Tree Conference
Scandinavian Society of Plant Physiologists

Further Graduate or Post-Doctorate Study

Post doctoral work in Plant Physiology under Dr. A. C. Leopold at Purdue University in 1960-1962.
NATO Visiting Professorship - University of Pisa, Italy - 1974

MAJOR CURRENT RESPONSIBILITIES:

Conducts research in relation to the rooting physiology of plants with special emphasis on the effects of centrifugation and identification of root promoting substances. Conducts studies on the effect of flooding on plants. Evaluates woody ornamental introductions for possible landscape use. Serves as Chairman of OARDC Turf and Landscape Day Committee.

D. C. KIPLINGER

ACADEMIC RANK: Professor

TRAINING: B.S. - Iowa State College - 1937

M.S. - The Ohio State University - 1938

Ph.D. - The Ohio State University - 1952

AREA OF SPECIALIZATION: Nutrition and physiology of floricultural plants

DIVISION OF TIME: OARDC 20% OSU 80% CES --

PROFESSIONAL EXPERIENCE:

1937-1938 - Student Laborer
1938-1940 - Graduate Assistant
1940-1941 - Assistant in Floriculture
1941-1946 - Assistant Professor of Horticulture - OSU & CES
1946-1952 - Assistant Professor of Horticulture - OSU, OARDC & CES
1952-1958 - Associate Professor of Horticulture - OSU & OARDC
1958- - Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership

American Society for Horticultural Science
Society of American Florists

CURRENT MAJOR RESPONSIBILITIES:

Teaches Hort 621 - Greenhouse Environment Control; Hort 622 - Commercial Floriculture I - Potted Plants; and Hort 623 - Commercial Floriculture II - Cut Flowers. Advises three graduate students. Responsible for the Howlett Hall floriculture greenhouses, serves as executive secretary of the Ohio Florists' Association and is responsible for the Ohio Florists' Short Course. Conducts research in the development and refinement of floral crop production techniques.

PHILIP C. KOZEL

ACADEMIC RANK: Associate Professor

TRAINING: B.S. - The Ohio State University - 1963

M.S. - The Ohio State University - 1965

Ph.D. - Cornell University - 1967

AREA OF SPECIALIZATION: Identification, adaptation, and use of woody plant materials.

DIVISION OF TIME: OARDC 25% OSU 75% CES --

PROFESSIONAL EXPERIENCE:

1968-1971 - Assistant Professor of Horticulture - OSU & OARDC
1971- - Associate Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership

American Society for Horticultural Science
Sigma Xi
Phi Alpha Xi
Gamma Sigma Delta
International Plant Propagators Society
International Shade Tree Conference
Ohio Nurserymen's Association
Ohio Arborists' Association

AWARDS: Distinguished Teaching Award, The Ohio State University - 1975

MAJOR CURRENT RESPONSIBILITIES:

Teaches Hort 432 - Landscape Horticulture II-Woody Deciduous Plants; Hort 433 - Landscape Horticulture II-Woody Evergreen Plants; Hort 434 - Landscape Horticulture IV-Woody Plants. Conducts research on characteristics and adaptations of shade and ornamental trees for street and highway landscape use. Serves as Chairman of Woody Plant Evaluation Studies in Ohio to select superior plants for residential and commercial plantings. Serves on the Board of Trustees of the Holden Arboretum, The Plant Selection Committee of the Ohio Nurserymen's Association and the Plans Review Committee for O.S.U. Serves as department's representative on College Committee on Academic Affairs, and is Chairman of the Shade, Ornamental, and Street Tree Evaluation Committee of I.S.T.C.

DALE W. KRETCHMAN

ACADEMIC RANK: Professor

TRAINING: B.S. - Michigan State University - 1953

M.S. - Michigan State University - 1954

Ph.D. - Michigan State University - 1958

AREA OF SPECIALIZATION: Culture and Physiology of Processing Vegetable Crops; Post-Harvest Physiology of Horticultural Crops.

DIVISION OF TIME: OARDC 70% OSU 30% CES --

PROFESSIONAL EXPERIENCE:

1958-1963 - Assistant Horticulturist, Florida Citrus Experiment Station, Lake Alfred
1963-1967 - Associate Professor of Horticulture - OARDC & OSU
1967- - Professor of Horticulture - OARDC & OSU

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science*
The Society of the Sigma Xi
The Michigan State Horticultural Society (Life Member)
The Florida State Horticultural Society
The Ohio Vegetable and Potato Growers Association*

Further Graduate or Post-Doctorate Study

Study tours of the processing vegetable industries of California, North Carolina, New Jersey in 1974: Michigan, Indiana, and Ontario, Canada during the summer of 1971; and Wisconsin 1975. Toured vegetable plant growing operations in Georgia in 1975.

MAJOR CURRENT RESPONSIBILITIES:

Conducts research relating to the culture of tomatoes, cucumbers, and cabbage for processing. Teaches Hort 652 - Advanced Vegetable Crops. Advises four graduate students. Serves as Chairman Department Curriculum Committee. Member Editorial Committee American Society for Horticultural Science.

ALVIN R. MOSLEY

ACADEMIC RANK: Assistant Professor

TRAINING: B.A. - University of Kentucky - 1965

M.S. - University of Kentucky - 1968

Ph.D. - Oregon State University - 1972

AREA OF SPECIALIZATION: Vegetable culture and physiology with emphasis on potatoes and fresh market vegetables

DIVISION OF TIME: OARDC 60% OSU -- CES 40%

PROFESSIONAL EXPERIENCE:

1971- - Assistant Professor of Horticulture - OARDC & OSU

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science*
Potato Association of America*

MAJOR CURRENT RESPONSIBILITIES:

Conducts research relating to cultural practices of potatoes. Serves as leader for statewide cooperative potato cultivar evaluation trials. Evaluates vegetable varieties for fresh market. Develops and executes extension educational programs for commercial potato and, to a limited extent fresh market vegetable, growers. Serves as Co-Chairman of the Potato Short Course. Prepares Spud Tips.

ANDREW C. PENG

ACADEMIC RANK: Associate Professor

TRAINING: Assoc. Degree in Hort. - University of Nanking, China - 1948

B.S. (Hons.) - Washington State University - 1961

M.S. - Michigan State University - 1962

Ph.D. - Michigan State University - 1965

AREA OF SPECIALIZATION: Plant lipids and soybean proteins

DIVISION OF TIME: OARDC 50% OSU 50% CES --

PROFESSIONAL EXPERIENCE:

1948-1949 - Associate Horticulturist, Taichung Agri. Expt. Station, Taiwan, China
1949-1952 - Inspector, Inspection Bureau of Agri. and Forestry, Taiwan, China
1952-1956 - 2nd Lt., Chinese Nationalist Army, Taiwan, China
1956-1958 - Program Assistant, US Information Service, Taiwan, China
1965-1967 - Project Leader, Swift and Co., R & D Center, Chicago, Illinois
1968-1970 - Assistant Professor of Horticulture - OSU & CES
1970-1972 - Assistant Professor of Horticulture - OSU & OARDC
1972- - Associate Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

Institute of Food Technologists*
American Oil Chemists' Society
American Association of Cereal Chemists

MAJOR CURRENT RESPONSIBILITIES:

Conducts research concerning lipid changes as related to keeping quality of processed horticultural foods, leaf proteins, and soybean-cheese whey curd. Teaches Hort 643 - Unit Operations in Processing Fruits, Vegetables and Related Foods III; Hort 647 - Technology of Fats and Oils; Hort 648 - Technology of Plant Proteins; Hort 743 - Enzymes in Horticulture-Food Processing; Hort 794b - Processing Methodology. Serves on the College Library Committee and the Departmental Graduate Committee.

HUGH A. POOLE

ACADEMIC RANK: Assistant Professor

TRAINING: B.S. - University of Florida - 1970

M.S. - University of Florida - 1971

Ph.D. - Cornell University - 1974

AREA OF SPECIALIZATION: Growth regulators, nutrition, and cultural problems of floral crops. Efficiency in Greenhouse Floral Crop Production.

DIVISION OF TIME: OARDC 55% OSU -- CES 45%

PROFESSIONAL EXPERIENCE:

1974- - Assistant Professor of Horticulture - OARDC & OSU

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science*
Tropical Region - American Society for Horticultural Science
Florida State Horticultural Society
Ohio Florists Association*
American Horticultural Society
American Orchid Society
Gamma Sigma Delta
Sigma Xi

MAJOR CURRENT RESPONSIBILITIES:

Conducts reseaarch on cultural practices with floral and foliage crops with special emphasis on integrating current technologies so as to increase production efficiency. Shares responsibility for development and execution of extension educational programs relating to commercial production of floral crops. Secretary of department (Wooster) Greenhouse Committee.

JERRY L. ROBERTSON

ACADEMIC RANK: Assistant Professor

TRAINING: B.S. - Purdue University - 1970

M.S. - Purdue University - 1972

Ph.D. - Purdue University - 1974

AREA OF SPECIALIZATION: Marketing and management of horticultural production and distribution enterprises with major emphasis on the floral crop and nursery industries.

DIVISION OF TIME: OARDC 30% OSU 70% CES --

PROFESSIONAL EXPERIENCE:

1974- - Assistant Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attend*)

The American Society for Horticultural Science*
The American Agricultural Economics Association*
The Society of American Florists
The Florida State Horticultural Society

MAJOR CURRENT RESPONSIBILITIES:

Teaches Hort 624 - Commercial Floriculture III-Design and Marketing; Hort 694a Commercial Floral Design and Hort 694b - Horticultural Marketing. Conducts research in the marketing and management areas, principally in relation to floral and nursery crops. He is a member of College Computer Committee. Serves as Executive Secretary of the Columbus Allied Florist Association and as a review editor for the Journal of the American Society for Horticultural Science.

HOWARD A. ROLLINS, JR.

ACADEMIC RANK: Professor

TRAINING: B.S. - University of Connecticut - 1950

M.S. - University of New Hampshire - 1951

Ph.D. - The Ohio State University - 1954

AREA OF SPECIALIZATION: Tree fruit physiology with emphasis on smaller than standard trees, orchard design, and pesticides in general.

DIVISION OF TIME: OARDC 25% OSU 50% CES 25%

PROFESSIONAL EXPERIENCE:

1954-1956 - Associate Horticulturist - Winchester Fruit Res. Lab-VPI
1956-1967 - Professor of Horticulture and Project Leader - Horticultural Extension-VPI
1967-1970 - Professor and Head of Horticulture-VPI
1970- - Professor and Chairman of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science (Fellow)*
American Institute for Biological Science
International Dwarf Fruit Tree Association*
National Peach Council
International Society for Horticultural Science
Sigma Xi

Further Graduate or Post-Doctorate Study

Six week study tour of European fruit production areas - 1964

MAJOR CURRENT RESPONSIBILITIES:

Overall coordination of departmental research, teaching and extension programs. Works with industry groups relating to the refinement of departmental programs. Serves on the Executive Committee of the Board of Directors of the American Society for Horticultural Science. Serves as Chairman of the College Greenhouse Vegetable Industry Committee.

ELTON M. SMITH

ACADEMIC RANK: Associate Professor

TRAINING: B.S. - University of Connecticut - 1958

M.S. - The Ohio State University - 1964

Ph.D. - The Ohio State University - 1967

AREA OF SPECIALIZATION: Landscape Horticulture

DIVISION OF TIME: OARDC 25% OSU -- CES 75%

PROFESSIONAL EXPERIENCE:

1960-1962 - County Agriculture Extension Agent, Connecticut
1964-1967 - Teaching Assistant - OSU
1967-1970 - Assistant Professor of Horticulture - OSU
1970-1975 - Associate Professor of Horticulture - OSU
1975- - Associate Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

Alpha Zeta
American Horticultural Society
American Rhododendron Society
American Society for Horticultural Science*
Gamma Sigma Delta
International Plant Propagators Society*
International Shade Tree Conference
Pi Alpha Xi*
Sigma Xi
Weed Science Society of America

MAJOR CURRENT RESPONSIBILITIES:

Develop and execute Extension educational programs in the nursery crops area. Conduct research in the areas of nutrition, weed control, and storage of landscape plants. Conduct investigations with container plants. Serves as Co-Chairman of the Ohio Nursery Short Course and the International Taxus Symposium. Serves on the College Exhibits Committee and the Search Committee for Forestry Department Chairman.

RONALD C. SMITH

ACADEMIC RANK: Assistant Professor

TRAINING: B.S. - University of Georgia - 1969

M.S. - University of Georgia - 1971

Ph.D. - The Ohio State University - 1973

AREA OF SPECIALIZATION: Landscape Horticulture, the identification and use of woody plant materials - landscape construction.

DISTRIBUTION OF TIME: OARDC -- OSU 100% CES --

PROFESSIONAL EXPERIENCE:

1973- - Assistant Professor of Horticulture - OSU

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science
American Horticultural Society
National College Science Teachers' Association
National Association of College Teachers of Agriculture*
Pi Alpha Xi
American Landscape Contractors' Association*

MAJOR CURRENT RESPONSIBILITIES:

Teaches Hort 111 - Introduction to Landscape Horticulture; Hort 112 - Principles of Landscape Horticulture; Hort 231 - Landscape Plants I; Hort 232 - Landscape Maintenance; Hort 233 - Landscape Plants II; and Hort 694c - Landscape Contracting, Construction and Maintenance. Serves on Departmental Undergraduate Committee and is a garden writer for Columbus Citizen Journal.

GEORGE L. STABY

ACADEMIC RANK: Associate Professor

TRAINING: B.S. - University of Connecticut - 1966

M.S. - Michigan State University - 1967

Ph.D. - Michigan State University - 1970

AREA OF SPECIALIZATION: Floriculture with emphasis on post-harvest physiology.

DIVISION OF TIME: OARDC 75% OSU 25% CES --

PROFESSIONAL EXPERIENCE:

1970-1974 - Assistant Professor of Horticulture - OSU & OARDC
1974- - Associate Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science*
International Society for Horticultural Science
Gamma Sigma Delta
Alpha Zeta
Pi Alpha Xi
Sigma Xi

MAJOR CURRENT RESPONSIBILITIES:

Conducts research relating to low pressure storage. Teaches Hort 609 - Post-Harvest Physiology of Horticultural Crops and Hort 431 - Landscape Horticulture I-Herbaceous Plants. Serves as Chairman of the Departmental Undergraduate Committee, is a member of the College Promotion, Tenure, and Grievance Committee. Advises two graduate students.

ELDEN J. STANG

ACADEMIC RANK: Assistant Professor

TRAINING: B.S. - Kansas State University - 1967

M.S. - Iowa State University - 1969

Ph.D. - Iowa State University - 1973

AREA OF SPECIALIZATION: Tree and small fruit culture.

DIVISION OF TIME: OARDC -- OSU -- CES 100%

PROFESSIONAL EXPERIENCE:

1967-1973 - Research Associate in Horticulture, Iowa State University
1973- - Assistant Professor of Horticulture - CES

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

Gamma Sigma Delta
American Society for Horticultural Science*
International Dwarf Fruit Tree Association*
Midwest Fruit Workers Conference*

MAJOR CURRENT RESPONSIBILITIES:

Develop and execute Extension educational programs relating to tree and small fruit production practices. Shares responsibility for the educational programs of the Ohio State Horticultural Society. Serves on departmental Extension Committee. Cooperates in tree fruit research studies including misting to delay bloom, the use of chemicals to enhance fruiting, etc.

T. DAVIS SYDNOR

ACADEMIC RANK: Assistant Professor

TRAINING: B.S. - Virginia Polytechnic Institute & State University - 1962

Ph.D. - North Carolina State University - 1972

AREA OF SPECIALIZATION: Landscape Horticulture, nursery crop production and the use of plant growth regulators to modify ornamental plant growth and development.

DIVISION OF TIME: OARDC 50% OSU 50% CES --

PROFESSIONAL EXPERIENCE:

1965-1969 - Vice President South Side Nurseries, Inc., Richmond, Va.
1972- - Assistant Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science*
American Society for Plant Physiologists
American Association of Nurserymen
Ohio Chapter, International Society of Arboriculture*
Plant Propagators Society

MAJOR CURRENT RESPONSIBILITIES:

Teaches Hort 633 - Management of Nursery and Garden Store Operations, Hort 631 - Arboriculture. Conducts research relating to plant growth regulation, burlap decomposition, and other studies relating to nursery crop production. Serves on the Departmental Curriculum Committee. Serves as Executive Secretary, Ohio Chapter, International Society of Arboriculture.

HARRY K. TAYAMA

ACADEMIC RANK: Professor

TRAINING: B.S. - University of Illinois - 1958

M.S. - University of Illinois - 1959

Ph.D. - The Ohio State University - 1963

AREA OF SPECIALIZATION: Commercial floriculture. Environmental effects, growth regulators, and pesticides.

DIVISION OF TIME: OARDC 10% OSU -- CES 90%

PROFESSIONAL EXPERIENCE:

1963-1964 - Assistant Professor, The Penn State University
1964-1967 - Assistant Professor of Horticulture - OSU
1967-1970 - Associate Professor of Horticulture - OSU & OARDC
1970- - Professor of Horticulture - OSU & OARDC

PROFESSIONAL IMPROVEMENT:

Society Membership

American Society for Horticultural Science
Society of American Florists

MAJOR CURRENT RESPONSIBILITIES:

Develop and execute Extension educational programs relating to the commercial production of floral crops. Assists with the planning and execution of the Ohio Florists' Short Course. Conducts applied research in the refinement of cultural techniques in the production of floral crops. Advises one graduate student and serves as Secretary of the Ohio State Floriculture-Landscape Horticulture Alumni Association.

JAMES D. UTZINGER

ACADEMIC RANK: Associate Professor

TRAINING: B.S. - The Ohio State University -1954-1959

M.S. - The Ohio State University - 1958

Ph.D. - The Ohio State University - 1969

AREA OF SPECIALIZATION: Horticultural Education, Fruit and Vegetable Extension Programs for Youth and Amateur Horticulturists

DIVISION OF TIME: OARDC -- OSU 25% CES 75%

PROFESSIONAL EXPERIENCE:

1959-1965 - Secondary School Physical and Biological Science Teacher
1965-1967 - Secondary School Vocational Horticulture Teacher
1967-1973 - Assistant Professor and Extension Horticulturist - OSU
1973- - Associate Professor and Extension Horticulturist - OSU

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

American Society for Horticultural Science
Ohio Vegetable and Potato Growers Association*
Ohio State Horticultural Society*
Columbus Vegetable Growers Association*

MAJOR CURRENT RESPONSIBILITIES:

Develop extension educational fruit and vegetable programs for youth and amateur horticulturists. Teaches Agron 200 - Plant Science in Agriculture. Advises one graduate student. Serves on N.J.H.A. Superintendent at the Ohio State Fair. Assists with vegetable cultivar evaluation studies. Serves on the College Farm Science Review Program and Policy Committee, The Departmental Curriculum Committee, and the Educational Advisory Committee of the Ohio Vegetable and Potato Growers Association. Serves as Secretary to the Ohio Horticultural Council.

E. C. WITTMEYER

ACADEMIC RANK: Professor

TRAINING: B.S. - The Ohio State University -- Graduate work at OSU (47 hours) but M.S. not completed.

AREA OF SPECIALIZATION: Vegetables and potatoes. Cultural practices.

DIVISION OF TIME: OARDC -- OSU -- CES 100%

PROFESSIONAL EXPERIENCE:

1948-1950 - Agronomist, American Agricultural Chemical Company
1950-1953 - Instructor - OSU & CES
1953-1955 - Assistant Professor of Horticulture - OSU & CES
1955-1957 - Associate Professor of Horticulture - OSU & CES
1959- - Professor of Horticulture - OSU & CES

PROFESSIONAL IMPROVEMENT:

Society Membership (Regularly Attends*)

Gamma Sigma Delta
American Society for Horticultural Science*
American Society of Agronomy
Potato Association of America*
European Association for Potato Research
Florida Horticultural Society
Ohio Vegetable and Potato Growers Association

MAJOR CURRENT RESPONSIBILITIES:

Develop and conduct Extension educational programs in areas of commercial potato production and commercial production of vegetables for processing. Assist Extension agents in developing educational programs in these areas. Cooperate with other faculty members on other vegetable Extension activities. Chairman of Departmental Extension Committee. Assist with potato cultivar evaluation studies.

This page intentionally blank.

This page intentionally blank.


DISCOVER
DEVELOP
DISSEMINATE